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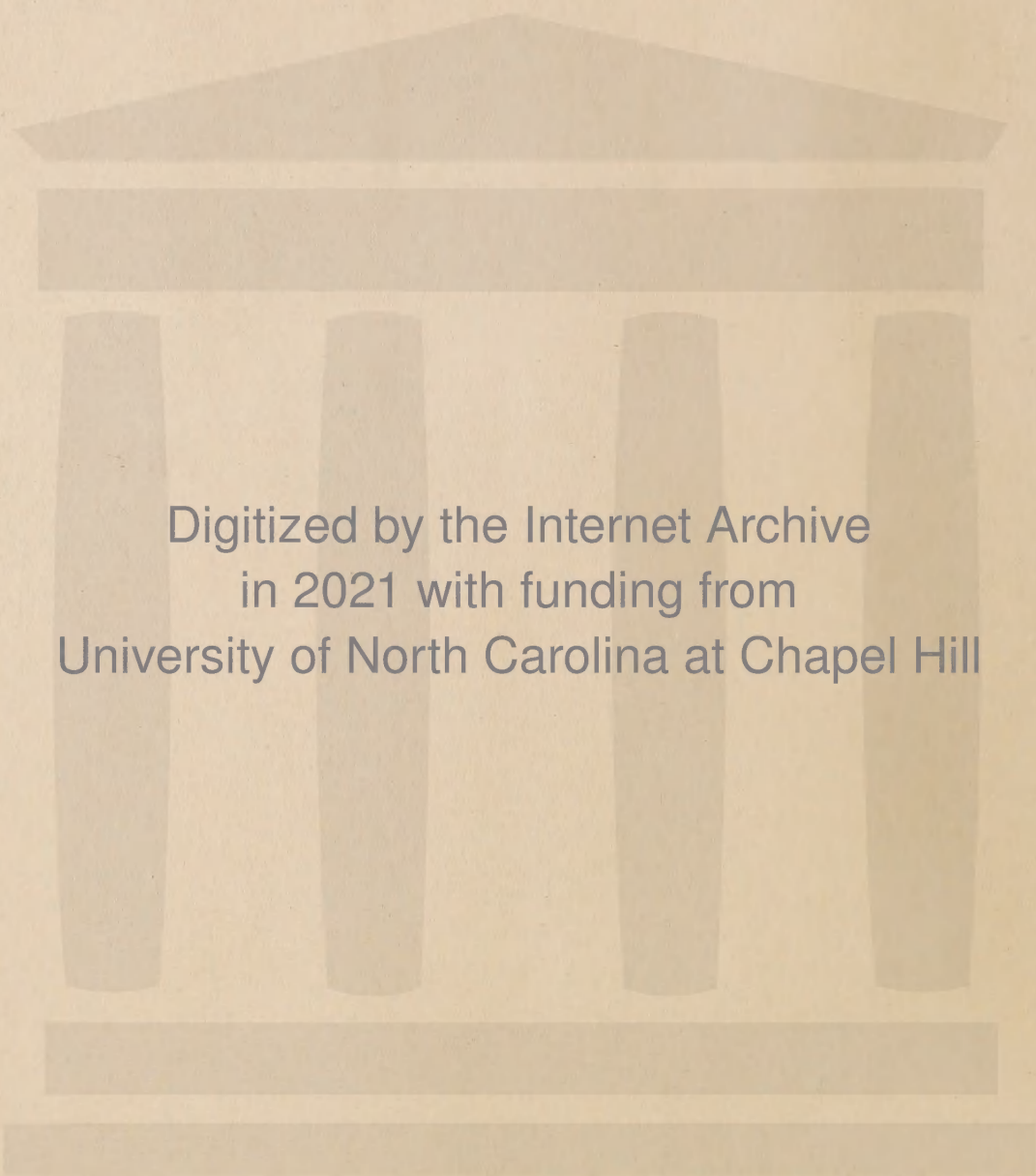
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JOSEPH HYDE PRATT

SOUTHERN & GOOD ROADS

A MONTHLY MAGAZINE DEVOTED TO HIGHWAY AND STREET IMPROVEMENT

Vol. VII. No. 1.

Lexington, N. C., January, 1913

10c. a Copy



In Historic Cumberland Gap; a Fine Example of Macadam Construction Under Difficulties

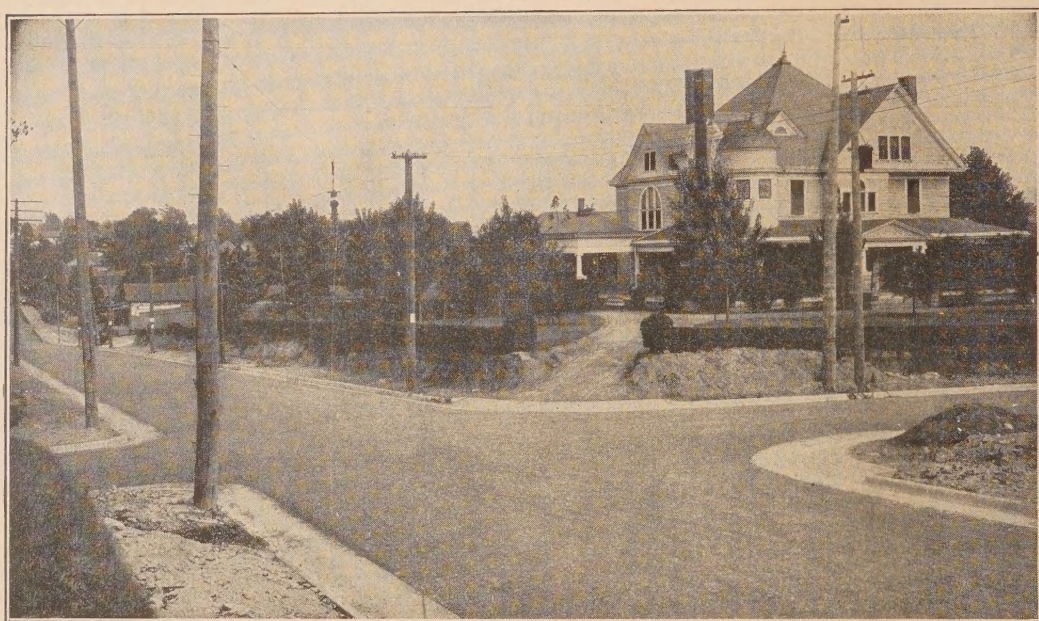
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LEXINGTON — NORTH CAROLINA

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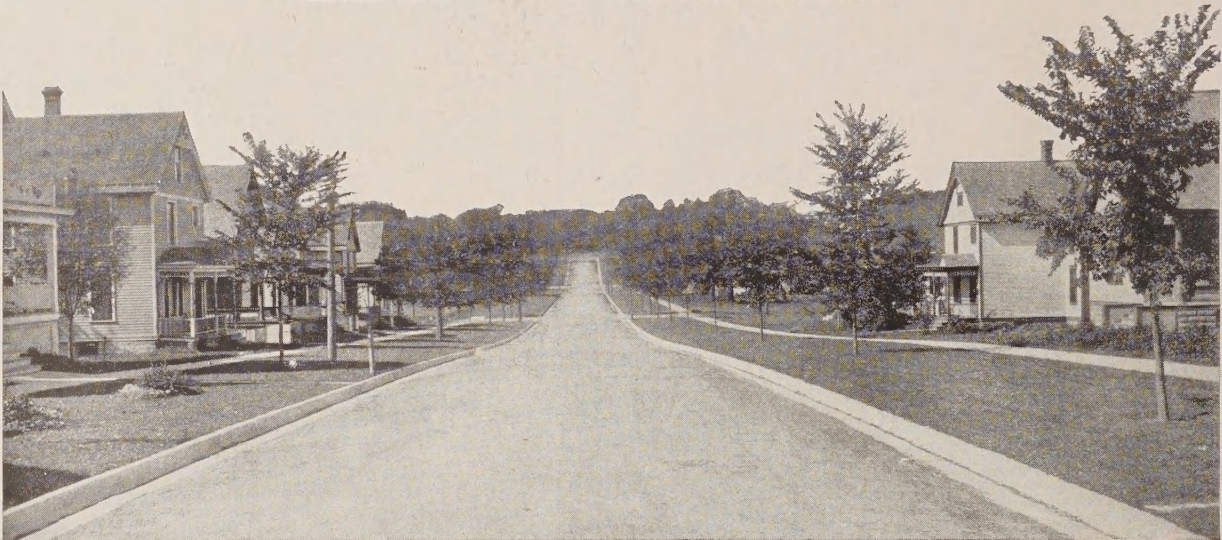
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Land and Industrial Agent
WASHINGTON, D. C.

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*Preserves Roads
Prevents Dust~*



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Madison's Experience with Tarvia

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Madison, Wis., has had a typical experience which began in 1910, when Marston Avenue was built with Tarvia X. This street is part of a boulevard route and receives much automobile traffic.

Tarvia X when introduced into the macadam gave to the road a plastic element and this automobile traffic simply ironed it out smooth. Instead of being in continuous disrepair, this street was soon considered a

model. Tarvia A and Tarvia B, the lighter grades of Tarvia for surface work, have also been successfully used in Madison, and the expense of maintenance by the Tarvia method decreases year by year.

An expert observer of these Tarvia streets is Mr. G. H. Mainwaring, County Highway Commissioner at Gotham, who writes:

"I have been watching the streets in Madison, on occasional visits there, and the good service your products seem to be giving with the considerable amount of mixed traffic, induces me to regard it highly as a surface treatment for country roads."

There are three kinds of Tarvia—"Tarvia X" for road and pavement construction, "Tarvia A" for surface work and Tarvia B for dust suppression and road preservation. The first two are very dense and viscid and require heat for application. "Tarvia B" is applied cold.

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Effect of Grade and Surface and Tractive Force

By E. B. McCORMICK

Dean of Engineering Division Kansas State Agricultural College

THERE are so many variables that enter in to affect the draft of any vehicle, that it is difficult in a test made under actual working conditions, to separate the effect of any one of the many for the same reason it is not safe to put too much confidence in the results obtained from a limited number of tests, or to compare the results made by different persons under unlike conditions and at widely varying times.

Some of the variables that are sure to enter in are:

1. The Team.
2. The driver.
3. Nature of surface.
4. Conditions of the surface.
5. Grade.
6. Width of tire.
7. Diameter of wheel.
8. Design and condition of vehicle.
9. Magnitude of load.
10. Curves.
11. Slopes.

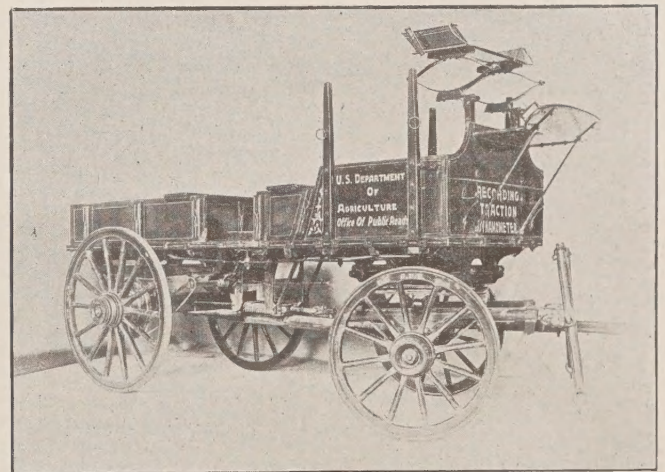
It has been found by the writer and by those with whom he has talked, that in any series of tests it is absolutely essential to select a team of horses or mules that are willing, and that have been trained to steady pulling and even starting, and to retain the same team throughout any series of tests. Furthermore, it is necessary to practice a constant deception on the team; in this way, the run should overlap the distance tested by an appreciable amount at each end; that is, the team should be driven several rods past the designated point before any attempt in checking it is made. If this is not done, after the first few trips the team will begin to stop before the point is reached, and the momentum of the vehicle will enter in and will vitiate, to a great extent, the results obtained.

Making the tests is, at its best, a slow tedious job, and it is difficult to secure a driver who will withstand the monotony and who can resist the temptations to stop and chat with passers-by. Careful accurate driving is absolutely essential.

The tests conducted under the supervision of the writer, since 1908, have been run with a traction dynamometer wagon owned conjointly by the U. S. Office of Public Roads and the Engineering Experiment Station of the Kansas State Agricultural College. The dynamometer proper is suspended from the bed of a Studebaker truck about midway between the front

and rear axles. The pull is transmitted by the tongue directly to the dynamometer, which pulls on the rear axle. The draft is measured by the compression of two carefully calibrated coil springs, and is transmitted through gears to a brass point which marks the record on sensitized paper operated by friction rolls but over a flat platen.

The following cuts show the arrangement of the dynamometer and also its method of attachment to the truck. The truck is provided with eight sets of wheels ranging from 1 $\frac{5}{8}$ inch tires up to 6 inch tires.



Recording Traction Dynamometer Wagon Owned Jointly by the United States Office of Public Roads and the Engineering Experiment Station of the Kansas State Agricultural College

Dynamometer Wagon.

The dynamometer was designed at the College in 1906, and has been in frequent use since that time. It was attached to the truck in 1908, and repeated calibrations have shown that the dynamometer registers very accurately.

While some road materials maintain their characteristics under different conditions, others vary materially with weather and atmospheric changes. Deterioration is much more rapid with some forms of road surface than with others, and some materials such as dirt, macadam, gravel, etc., are subject to occasional changes in conditions from which the harder materials are

free. A pebble $\frac{1}{2}$ inch in diameter may show an increase of from 50 to 75 per cent in the draft required at that particular point; or the wheel may strike it in such a way that no apparent change can be detected.

Of the other variables some will become constants for any particular stretch of road; others, such as width of tire, may be governed in some instances; while still others, such as design of vehicles, can seldom be taken into consideration.

Grades.

Increasing the grade decreases the load that can be hauled, in each of three ways:

1. The required pull per ton is increased.
2. The possible pull of the horse is decreased by the effort required for the horse to raise his own weight through the grade.
3. The effective pull of the horse is diminished by a change in the angle of the application of the pull.

There are no ways of overcoming the first two losses; the third however, can be nearly if not entirely eliminated by a change in the methods of hitching. A comparison of the figures in the following table will show very clearly the decrease of effective work with the increase of grades. The first column shows the actual pounds of pull required to draw a gross load of 5270 lbs. over a dry hard earth road, solid and well compacted, no dust, and using $1\frac{1}{2}$ inch tires. These figures are from a test made at the Kansas State Agricultural College on Aug. 12th, 1912. The third column gives pounds pull required per ton as figured from values in the second column. The fourth column gives draft in pounds per ton as taken from results of tests on macadam roads. The fifth column shows possible pull of 2800 lb. team on the different grades. These figures assume that a team can exert a pull equal to 1-3 of its weight for a short time, on the level, and that on grades the tractive effort of the team decreases an amount equal to the grade resistance due to its weight, as calculated by the formula:

$$X = \frac{W}{3} - \frac{W}{100}G$$

Where W = Weight of Team

X = Tractive Effort of Team

G = Per Cent. of Grade.

Per Cent. Grade	5270 Pounds.	Dirt Road Per Ton	Macadam Per Ton	Possible Pull of 2800lb Team for a short Period of Time
0	263.0	100	38	933
1	315.7	120	58	905
2	368.4	140	78	877
3	421.1	160	98	849
4	473.9	180	118	821
5	526.5	200	138	793
6	579.2	220	158	765
7	631.9	240	178	737
8	684.6	260	198	709
9	737.3	280	218	681
10	790	300	238	653

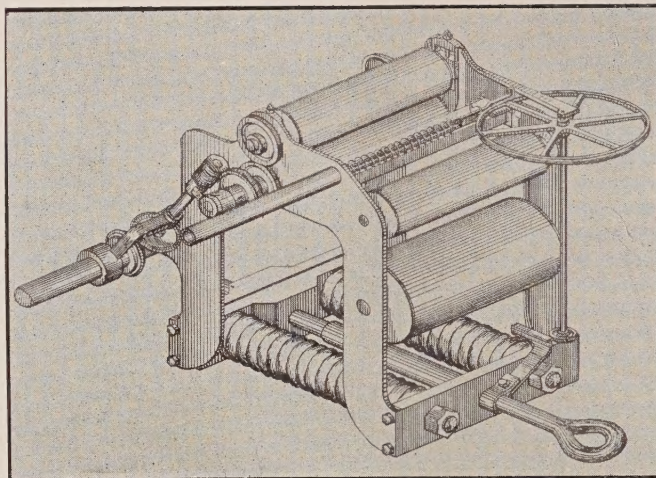
A comparison of these figures will show that the necessary pull on a 10 per cent grade, over that on a level, is 200 per cent for a dirt road, while the decrease in effective pull for any given team is nearly 30 per cent. and that for a dirt road any given team can pull on a 10 per cent grade only 2-9ths of the load that it can draw on the level.

It must be remembered that while a team may exert

an effort equal to 1-3 (or even $\frac{1}{2}$) its weight for a short length of time, it cannot do so for an extended period. The value in such case, as given by different authors, varies 1-10 to 1-5 the weight of the team.

It is customary to state the probable pull of a horse or team in terms of its weight. This of course is not accurate, as a well trained team of 2000 lbs. will often-times outpull a poorly trained team of 2600 lbs. or 2700 lbs.

In order to get some figures from recent practice, the writer, on Sept. 12th, 1912, had observations taken on four teams hauling brick a distance of practically two



Recording Traction Dynamometer of the Engineering Experiment Station
Kansas State Agricultural College

miles over five different kinds of road surfaces. These teams are used in delivering coal from the railroad to the Kansas State Agricultural College, and are accustomed to hauling heavy loads under all sorts of road conditions. The results obtained from these observations are undoubtedly larger than can be secured by taking an average of a large number of teams selected at random. In the following tables are given the nature of the road surface, the weights of the loads and the teams, the length, grade, and condition of the road, the apparent effort exerted by the team, the number of rests made, and the theoretical draft that would be required as shown by the draft required for surfaces of that nature. From the draft required for the given load, and the weight of the team, was calculated the probable pull of the team in percent of its weight.

CINDER ROAD.

	Load Weight.	Team Weight.	No. of Re. ts.	Theoretical Draft Required.		Probable pull of Team in per cent. of its weight.
				Per Ton	Per Load	
First Load	8770	2580	1	92	403.5	32.63
Second Load	8440	2600	1		388.3	31.16
Third Load	8160	2620	1		375.4	29.80
Fourth Load	7090	2670	1		316.2	25.40
Total	32460	10470				119.00
Average	8115	2617.5				29.75

The length of the road on which the test was made was 500 feet. There was no grade and the condition of the road was solid but dusty, with rough spots where the tires had cut into the road. Apparently it took a

heavy pull for the team to start the load and heavy pulling to keep it moving.

ASPHALTIC CONCRETE.

	Load Weight.	Team Weight.	No. of Rests.	Theoretical Draft Required.		Probable pull of Team in per cent. of its weight.
				Per Ton	Per Load	
First Load	8770	2580	0	40	175.4	23.8
Second Load	8440	2600	0		168.8	22.7
Third Load	8160	2620	0		163.2	21.8
Fourth Load	7090	2670	0		141.6	18.6
Total	32460	10470	0			86.9
Average	8115	2617.5	0			21.7

The length of road was 2760 feet, grade 1.5 per cent. the condition of the road very good and it was apparently easy for the team to start the load and keep it moving.

BRICK PAVEMENT.

	Load Weight.	Team Weight.	No. of Rests.	Theoretical Draft Required.		Probable pull of Team in per cent. of its weight.
				Per Ton	Per Load	
First Load	8770	2580	0	56	245.5	26.5
Second Load	8440	2600	0		236.3	25.4
Third Load	8160	2620	0		228.5	23.9
Fourth Load	7090	2670	0		198.3	20.7
Total	32460	10470				96.5
Average	8115	2617.5				24

The length of the pavement was 5000 feet, grade .5

per cent. condition good and the effort of team in starting load and carrying it on is set down as "medium."

DIRT ROAD.

	Load Weight.	Team Weight.	No. of Rests.	Theoretical Draft Required.		Probable pull of Team in per cent. of its weight.
				Per Ton	Per Load	
First Load	8770	2580	1	100	438.5	34
Second Load	8440	2600	1		422	32.5
Third Load	8160	2620	1		408	30.6
Fourth Load	7090	2670	1		354	26.5
Total	32460	10470				123.6
Average	8115	2617.5				30.9

The length of road was 1050 feet, no grade and the condition good—well compacted, dry but not dusty and surface smooth. Apparently the efforts of team to move load were very heavy.

MACADAM ROAD.

	Load Weight.	Team Weight.	No. of Rests.	Theoretical Draft Required.		Probable pull of Team in per cent. of its weight.
				Per Ton	Per Load	
First Load	8770	2580	3	150	658.8	42.50
Second Load	8440	2600	3		633.0	40.60
Third Load	8160	2620	3		612.0	38.90
Fourth Load	7090	2670	3		531.0	33.00
Total	32460	10470				155.00
Average	8115	2617.5				38.75

Length of road, 1500 feet, grade 5 per cent. road sol-



Rock Asphalt Construction at Bowling Green, Kentucky



What Good Roads Mean to Southern Women. This Fine Piece of Macadam is at Rome, Georgia

id and surface in good condition. Heavy pulling the entire length of road.

The results of these observations would indicate that a well trained team can exert a pull of from one-fifth to $\frac{1}{4}$ of its weight through a distance of practically one mile; a pull of from $\frac{1}{4}$ to slightly over one-third of its weight for a distance of 500 feet, and, on macadam, a pull of from one-third to nearly $\frac{1}{2}$ of its weight up a 5 per cent grade for a distance of 500 feet.

Therefore in considering the permissible grade, in any given case, it is necessary to take into consideration the probable weight of load to be hauled, and the type of horse to be used; then the maximum permissible grade will be that that the team of horses can draw over that grade. This will be determined by figuring the time necessary to travel from the bottom to the top, and the possible force that the team can exert for that length of time.

Materials.

The figures given in the description of the effect of surface are taken from tests conducted under the supervision of the writer during the past few years; from those conducted by Professor H. J. Waters at the University of Missouri, some years ago, and from other sources, indiscriminately, when the indications were that sufficient tests had been made to give dependable results. Those conducted by the writer were made, in both dry and wet weather, on dirt roads of various kinds; on gravel, macadam, and oil roads; on vitrified paving brick, and on asphaltic concrete. Those made by Professor Waters include block pavements in good and in poor condition, fair macadam, best macadam, cobble stone, and various types of dirt roads. The

other figures are for granite tramways, wood block, asphalt, and macadam.

Deductions drawn from the averages, obtained by combining these different tests, are not strictly accurate as the tests were conducted under different conditions of driving, vehicle, etc., but as these varying conditions exist in practice, the writer has deemed it of interest to combine the tests and average the results. The following are the figures so obtained:

Surface	Traction Force per Ton.
Earth packed and dry	100
Earth—dusty	106
Earth—muddy	190
Sand—loose	320
Gravel—good	51
Gravel—loose	147
Cinders—well packed	92
Oiled Road—dry	61
Oiled Road—wet	108
Macadam—very good	38
Macadam—average	46
Sheet asphalt	38
Asphaltic concrete	40
Vitrified Brick—new	56
Wood block—good	33
Wood block—poor	42
Cobble stone	54
Granite tramway	27

Incidentally, tests cannot show the force with which a team grips these different pavements, and, therefore, as will be discussed later, these figures must not be used without taking other variables into consideration.

In determining the permissible grade for any given road road material, it is absolutely essential that the effect of atmospheric conditions, and particularly of

rain on that surface, be taken into consideration. Moisture may have little effect, in some cases, on the draft of the vehicles, while it may affect very seriously the ability of the horses to get a grip. On the other hand, the nature of the surface may be such that the horse can secure nearly as good footing when wet as when dry and yet the draft may be increased very materially. In the case of some dirt roads, one or the other may be affected, and both may be. Macadam and gravel



In Eastern North Carolina the First Question is Drainage. This is the Road Between Columbia and Creswell

roads show probably less effect than others unless it is the oil road.

The effects of temperature and of moisture are shown very clearly in two tests made at Manhattan, Kansas, in July, 1912, on dry and on wet asphaltic concrete. During the test the atmospheric temperature increased from 82 degrees F. to 98 degrees F. On the dry surface the draft increased 28 per cent; on the wet 17 per cent. It is very apparent that any consideration of asphaltic concrete for use in any particular place, that does not take account of the probable temperature, will, of necessity, be incomplete.

If the tractive force per ton was the only factor that entered in in determining grades and materials, the solution of the problem would be comparatively simple, as with any given material and with known loads, the maximum grade of any given length will of necessity be fixed; but, besides the difference in pulling power that exists among horses, and particularly when combined in teams of two or more, there is also to be taken into consideration the effect of the surface on the grip of the horse. This feature varies with any given substance according to conditions of temperature and moisture, and is not determinable to any degree of accuracy. The question of the related allowance to be made for this feature is one that must lie with the judgment of the engineer, and the best judgment is that based on the observation of the paving materials under the various conditions. In some cases the materials that rank best when dry, are among the worst when wet, as, for instance, asphalt and asphaltic concrete.

In the opinion of the writer, the best pavement for steep grades, considering both security of footing and the tractive resistance, is either granite block or vitrified paving block with the spaces between the blocks filled with asphalt or pitch. The softer material in the crevices offers a grip for the calks of the shoe. In the case of cobble stone the effect of the uneven surface, while beneficial to the grip, is to increase the tractive

force required, and seriously to increase chance of injury to the horse.

The statement is sometimes made that "As a chain is no stronger than its weakest link, neither is a road any better than its steepest grade or longest stretch." This statement is not strictly accurate however, because a horse can exert, for a short period of time, far greater force than can be held for some time at a stretch. The same is true of a steam engine, or an electric motor, and, to a limited extent, of a gasoline engine. It will be found, in many cases, to be good engineering practice to let a moderately steep grade remain rather than to make excessive cuts and fills, particularly under some conditions of surrounding property.

In this connection it may be interesting to note the grades existing in some cities, as given by Mr. Tillson in his work on "Street Pavement & Paving Materials." In New York there are instances of grades of 12.17 per cent; 15.17 per cent; and 18.17 per cent. In Pittsburgh grades of 17 per cent; in Duluth of 12.2 per cent; and in Kansas City of 16.5 per cent.

It must be remembered however, that every per cent decrease of grade means a net saving of 20 lbs. per ton in the tractive force required, as well as increasing the effective pull of the horse.

Concrete Roads Successful.

The success of Wayne county with concrete roads has led to a great deal of discussion among road commissioners in other cities," said Edward N. Hines, of Detroit, Mich., one of the road commissioners of Wayne county. "We have tried them here for a number of years and have found them satisfactory in every way, as well as cheaper than roads of other construction. They are being opposed all the time, however, by the makers of other sorts of paving material, and all sorts of things are said about them which are not borne out by the experience of this county. As a result we are continually receiving letters from other counties asking why Wayne county continues to use concrete for road making when so many circulars and booklets against concrete are being published all the time. We have the facts and figures, however, and are willing to prove that in this county, at least, concrete has been the most successful material."

Speakers for the Arkansas Good Roads Convention.

The following acceptances to attend and deliver addresses at the good roads and drainage convention to be held in Little Rock, Ark., on January 23 and 24, have been received: John H. Page, state commissioner of mines, manufactures and agriculture, "Arkansas Road Statistics"; H. L. Rammel, "Profits of Good Roads to City and Country"; Charles S. Stiff, president of the Little Rock Board of Trade, "The Duty of Commercial Organizations to Good Road Building"; Governor-elect Joe T. Robinson, "What the state of Arkansas Should Do for Good Roads."

Interstate Good Roads Association Organized.

The Interstate Good Roads association was formed recently at Bowie, Texas, for the purpose of completing a portion of the Meridian highway from the southern line of Kansas, through Oklahoma and North Texas as far as Fort Worth. Money has been pledged to drag the route from Red River through Clay, Montague and Wise counties and connect with the Tarrant county bridge. Money to build a bridge over the Red river to cost approximately \$50,000 has been pledged.

Work of the Army in the Construction and Maintenance of Roads

By SPENCER COSBY

IT IS a well-known saying that an army marches on its stomach, but it is perhaps not so generally recognized by the laymen that the keeping of that stomach in a proper condition for marching—in other words, the keeping up of the efficiency of the army—is largely a question of roads. It is indeed possible for troops to march through a country without roads, through dense forests, across bridgeless streams, over pathless mountains, and small bodies of troops have many times been compelled to overcome just such natural obstacles. So great, however, is the difficulty of supply in such cases that a campaign in a section without roads is never undertaken unless there is no other way of achieving the result sought or unless the advantages to be gained are enormous; even then, if the body of troops to be moved is large, or if the results of the campaign are to be lasting, the building of roads will be one of its most important features.

In the case of great wars, however which are usually carried on in civilized lands, the roads are one of the most important of all the factors to be considered and no one is more interested than the soldier in the maintenance of good roads through the country. In these modern days the railroads, as the main arteries of supply and transportation, are the first roads to be taken into account, but the country highways and byways in the actual field of operations have lost none of their old-time importance. The leaders of the army must have a thorough knowledge of every one of them, while the engineers of the army must be ready to open roads that the passage of the army or the operations of the enemy have rendered impassible, to maintain the good roads in good condition, to improve the bad roads, and to build new roads if necessary.

Military Roads in Other Lands.

From the earliest times the soldier has been intimately associated with the making of roads. The school boy still struggles with the description of the roads built by the armies of Xerxes and Hannibal. The famous old paved Roman roads, remains of which are to-day found in many parts of Europe, some still in use, were essentially military roads, while the greatest soldier of modern times, Napoleon, was also one of the greatest road builders. He it is that France has to thank for its system of magnificent highways, which were built for military purposes and are still kept up by the government largely with this end in view.

Roads in the United States.

In our country, however, the army has been concerned not only with the construction and maintenance of roads as a military necessity—and we all know of its struggles with the fearful dirt roads of old Virginia during the civil war—but it has had and still has much to do with the building and upkeep of roads not strictly military in many parts of the United States and its recently acquired outlying possessions. During the early days of the Republic the graduates of West Point were, except for a few foreign engineers, practically

the only men in the country who had a thorough technical training. They not only surveyed and mapped a large part of the unexplored west, but laid out and built most of the first railroads in this country as well as in Russia, Cuba, and Mexico. It was but natural that they should be largely employed in such work of road building as was engaged in by the general government. Most of the members and assistants of the Board of Engineers, created by act of congress in 1824, were army officers; one of the chief duties of this board was the making of surveys, plans and estimates for such roads as the president might "deem of national importance in a commercial or military point of view, or necessary for the transportation of the public mail." The board was placed under the Engineer Department of the Army.

The question of the constitutional power of the government to build roads and of the general policy to be pursued in this respect was one of the burning questions of the day between 1805 and the end of the thirties; it was the subject of many congressional reports, of at least three presidential vetoes, of several presidential messages, and of important judicial decisions. Since the last large appropriation for the Cumberland Road was made in 1838, the government has practically confined its road building in the United States proper to military roads, and those built on land under the control of the government.

The Cumberland Road.

In 1806 the government undertook the construction of the famous old "National" or Cumberland Road, as it came to be known; it was originally intended to extend from tidewater on the Atlantic Ocean to the Ohio River, but it went much further; it was actually completed from Cumberland, Maryland, through the states of Maryland, Pennsylvania, West Virginia and Ohio, to Springfield, Ohio, and partly built from there to Vandalia, Illinois, a total distance of 591 miles. Subsequently it was donated to the states through which it passes. Congress appropriated in all nearly seven million dollars for its construction and maintenance, and the services of many graduates of the Military Academy were employed in the work. The roadbed was cleared over a width of 80 feet but only 30 feet of this was covered with stone. It was the longest stone road ever built by a single agency in the United States.

The work of clearing the ground for the road actually began in 1808, but the first contract for construction was not let until 1811. The western section was built under direction of the treasury department at a cost of \$1,702,000 in 1827; this department continued in control until the last section of the road was surrendered to the individual states in 1856. It was soon after the army took charge that the macadam system was regularly and scientifically adopted for the construction and repair of the road. Prior to that time it had been built by digging a trench, so as to sink the bed below the natural surface of the ground; this trench was filled



Chert Gravel, Near Cleveland, Tennessee. Part of the Results of a Two Hundred Thousand Dollar Bond Issue

with large stones, these were covered with stones of a smaller size, and those in turn with gravel. This system made drainage difficult and the road deteriorated rapidly; in a report made in 1832 the old Maryland section of the road is stated to be "in a shocking condition," some of it "almost impassable." The road was rebuilt by macadamizing it over the old bed, great attention being paid to the proper location and construction of ditches and culverts.

The Cumberland road, as finally completed by the army engineers, exemplified the application of the best principles of road building known in its day and was the most important, as well as one of the first, modern roads in this country. It represented a big advance over the methods used in constructing the early state turnpikes, on which many millions had been expended. The road with its ponderous stone bridges and culverts is still in use, and it is said that in many places the old macadamized bed is still doing duty.

Other Government Roads.

While the Cumberland road was building, the army was engaged in the construction of many military roads in the west and south, chiefly for the purpose of enabling supplies to be hauled by wagon to the advanced military posts. Many of these roads were built by the troops themselves under the direction of their officers, and were generally constructed in the simplest possible manner that would permit the passage of the rough

wagons of the day. As the country became settled, the traffic over many of these highways became so heavy that in parts at least they were improved both as to location and character of road surface. Examples of these early military roads are that from Detroit, Michigan, to the Maumee river, built by Major John Anderson in 1817; the military road from the Tennessee river to New Orleans begun in 1816; the military road through Mississippi built in 1819-20; the roads in Florida to St. Augustine and from the Georgia state line to Smyrna, Florida, constructed between 1824 and 3—; and those in Arkansas to Little Rock, and from Fort Leavenworth, Kansas, to Fort Smith, Arkansas, built by the infantry in 1837-38.

From 1824 to 1838 congress made extensive appropriations for roads in various parts of the United States; after 1838 a few small appropriations were made from time to time; all these roads were built under the direction of the army. At first they were constructed partly by the Quartermaster's Department, and partly by the Engineer, but after a few years all road work except at army posts was transferred to the engineers. The nature of these early roads can be imagined from the fact that in December, 1828, the Quartermaster-General reported to congress that in the preceding 4½ years his department had completed 1456 miles of roads in Florida, Georgia, Arkansas, and Louisiana at a total cost of \$77,077, not quite \$54 a mile. Some of these roads must have been wonders, as for instance

the one reported completed from Pensacola, Florida, to Fort Mitchell, Georgia, 233 miles at an expense of \$1138, almost \$5 a mile. I can find nothing done by the Engineers to equal this record, though they do report a road built in New Mexico 300 miles long, at a cost of \$40 a mile. The employment of troops in the construction undoubtedly cut down the cost in many cases. The most important road built by the Quartermaster's Department was apparently a military road in the northeastern part of Maine, 95 miles long, built between 1828 and 1834 at a cost of \$137,000.

The roads built by the engineer department were mostly of a primitive character; prior to 1860 the number of roads reported as having been surveyed and constructed, improved or completed by them was 57, having an aggregate length of 6,583 miles and costing in all \$1,920,000, thus averaging a little over \$291 per mile. These roads were built in the states of Alabama, Arkansas, Florida, Idaho, Iowa, Indiana, Illinois, Kansas, Michigan, Minnesota, Montana, Nebraska, New Mexico, Oregon, Washington, and Wisconsin. The most important were the road which was to run from Memphis to Little Rock, and which was actually constructed as far as the St. Francis River at a cost of over \$6,000 a mile; the road from Detroit to Chicago, 263 miles costing \$88,900; a road from Point Douglass to the mouth of the St. Louis River, to connect the head of navigation of the Mississippi River with Lake Superior, 173½ miles, costing \$120,600; from Omaha to

Ft. Kearney, Nebraska, 168 miles, costing \$50,000; from Santa Fe to Tace, New Mexico, 73 miles, costing \$51,000; from Scottsburg to Myrtle Creek and Camp Stuart, Oregon, 160 miles, costing \$109,300; and the Mullan Road from Fort Benton on the Missouri River in Montana to Walla Walla, Washington, 624 miles costing \$200,000.

The 57 roads just mentioned do not include the Cumberland Road, on which the government spent an average of over \$10,000 per mile nor the trail opened by the engineers in 1854 from Salt Lake City to the eastern boundary of California, a distance of over 600 miles at a cost of \$25,000.

Of the 57 roads built by the Army engineers, some were purely military in character and others partly so, but many were intended to open up communication with newly developed territory, to induce the sale of public lands, and to facilitate emigration and the transportation of the mails. None of these roads, with possibly one exception were, I believe, metalled. The character of the construction is indicated in the following extract from a report made in 1840 by the Chief Engineer in charge of the works.

"I have not considered the obligation of the Government in reference to these roads, to involve more than what is understood by the 'opening of a road' or the construction of one on the most simple principles; that is, that the timber should be cut down and removed, the undergrowth grubbed up and removed, ditches dug on



"Over the Hills and Far Away." Beautiful Macadam in the Heart of the Tennessee Mountains, Near Clinton



In Old Virginia. Guiter's Pike, Near Richmond, a Magnificent Specimen of Macadam Construction

the sides of the road where required, swamps made passable by the customary log structures, and bridges thrown over streams that are not conveniently fordable, leaving all artificial structures of a road-bed to the future efforts of the local authorities, or to positive legal enactments by the general government."

The Old Santa Fe Trail.

Another famous highway with which the army was long and intimately associated was the old Santa Fe Trail, extending from Fort Leavenworth, Kansas, to Santa Fe, New Mexico. In its palmy days the travel over it was large and important, but as far as I have been able to ascertain, no great amount of road work was done upon it by the army or anyone else. Travelers were far more concerned with the ever present danger of attack by Indians than with the condition of the road bed, and to guard and defend travel on the old Trail was long one of the arduous duties of our army in the west. The main line of the Atchison, Topeka and Santa Fe Railroad closely followed the old trail in many places.

Wayne's Trace.

Many thousands of miles of the main highways in the fertile states west of the Ohio are, so to speak, the lineal descendants of the trails and roads first broken through the wilderness by the army in its numerous explorations and in its expeditions against hostile Indians. The precursor of all of these was the road known as Wayne's Trace, cut by General Anthony Wayne through the forests of Ohio and Indiana during his Indian campaign of 1794. It began at what is now called, I believe, "Mad Anthony street" in Cincinnati,

and extended northward through the present towns of Hamilton, Greenville, Fort Recovery, and Defiance to Maumee, where the decisive victory of Fallen Timber was won. From there the road was extended to Fort Wayne, named in honor of the victorious general.

Explorations.

The earliest knowledge of much of our western country and the location of the first routes of travel were largely the result of military explorations and reconnaissance work from 1800 to 1880. Some of the most notable expeditions were those of Captains Lewis and Clarke, 1804 to 1806, to the sources of the Missouri and down the Columbia to its mouth; of Lieutenant Pike, 1805-7, to the sources of the Mississippi and Arkansas; of Captain Booneville, 1832-36, to Great Salt Lake and the region west of the Rocky Mountains; and of Captain J. C. Fremont, 1842 to 1846, during which he mapped the road from the Missouri River to Oregon and explored upper California and Oregon. From 1845 to 1861 many other army officers were detailed to continue these explorations and to locate military roads in the western wilds. Among the officers actively engaged on this work were Lt. Col. Joseph E. Johnston, Captain George B. McClellan and Lieut. H. K. Warren, who a few years later became distinguished generals in the civil war.

During that war the engineer troops were, among other duties, extensively employed in building and repairing roads in connection with the campaign in Virginia. The usual method of repairing the old dirt roads in important cases was to corduroy them; this generally consisted in laying a number of stout sill timbers

lengthwise and placing transversely over them saplings 4 to 6 in diameter, tied down by side rails, which were in turn anchored by pickets. Many hundreds of miles of these roads were built during the war.

As soon as the war was over, the army resumed on a more extensive scale than ever its work of exploration and of survey in the west. In addition to the many large expeditions set out, small detachments of engineer troops were employed in reconnaissance work throughout the west under the direction of engineer officers; it is recorded in the annual report of the chief of engineers for 1876 that the enlisted men in the west during three years reconnoitered and mapped 24,044 miles of routes traversed by scouting parties and expeditions against hostile Indians.

Roads in National Parks.

In the numerous areas of land owned by the government throughout the United States, such as military posts and reservations, national cemeteries, sites of river and harbor works, and national parks the army has built hundreds of miles of good roads. The most extensive of these systems is probably that in the Yellowstone National Park, comprising a total mileage of some 345 miles. These roads were built by the army engineers who spent about two million dollars in their construction, maintenance and repair. Most of the roads are metalled, and though they cannot be considered as roads of the first class as yet, they are fully as good as the amounts appropriated by Congress (averaging about \$3,000 per mile for construction) would permit. They are well located and well drained, and many great natural obstacles have been overcome in building them through a difficult mountain range.

Plans and estimates have been prepared by the war department for the improvement of these roads in accordance with the best principles of modern practice as soon as congress provides the necessary funds. A road 25 miles long has been built by the army engineers in the last eight years leading into the Mount Ranier National Park at a cost of about \$250,000.

Roads in the District of Columbia.

Since 1874 all street and road work in the District of Columbia has been under the charge of officers of the corps of engineers. The present condition of the city streets and suburban and park roads give evidence of the faithfulness with which this charge has been exercised.

A description of the road building activities of our army would not be complete without a brief reference to the work done by it in recent years in lands beyond the sea.

In Cuba.

During the period of the first American Intervention in Cuba, just after the Spanish War, the road work under the army was confined chiefly to making passable the existing roads and bridges which had suffered severely during the preceding years of revolution.

At the time of the second military occupation of Cuba, the Americans found only 380 miles of improved roads in an island the area of which is 41,000 square miles. The adjacent islands of Jamaica, one-fifth the size, had over 6,000 miles of such roads. The unimproved roads in Cuba hardly deserved the name; transportation over them was costly and slow, being carried on by means of pack trains and two-wheeled carts, and the latter often found the roads impassable. In the two years of



The Roseville and Sherman Heights Chert-Gravel Road Near Chattanooga, Tennessee

American intervention, from 1907 to 1909, in addition to extensive repairs made to the existing roads, over 460 miles of new roads were either completed or well advanced towards completion. This work was done under the department of public works, at the head of which was an engineer officer of the United States Army and some of it was done under the direct charge of engineer troops. The roads were all macadamized for a width of 16 feet and given a maximum grade of 6 per cent.

In the Philippines.

During the first two years of their occupation of the Philippines the Americans had their hands full in fighting the insurgents, but even then the army did considerable work in the repair and maintenance of roads and bridges in the course of its questions. In 1900 however, before the fighting was fully over, detachments of engineer troops were sent to various of the Islands charged with the repair of roads and bridges; the number of these detachments was increased during the following year and many hundreds of miles of roads were repaired, and in numbers of cases entirely rebuilt. During the course of this work one officer was killed and one captured by the insurgents.

The first act passed by the United States Philippine Commission appropriated one million dollars from Insular funds for the repair of roads and bridges. This work was placed under the army engineers. Other large appropriations were subsequently made, and much of the work, especially in the beginning, was executed under the direction of army officers. Even now they still have charge of the work in the Moro Province.

In Porto Rico.

During the nearly four centuries of Spanish rule in Porto Rico, only 158 miles of permanent roads had been constructed in the island. During the two years of American military government immediately following the war, \$155,000 was spent in the repair and maintenance of these old roads, and about a million and a half was expended or contracted for in the construction of 125 miles of new roads.

In Alaska.

It is a long leap from the tropics to Alaska, but there too our army has in recent years been actively engaged in road building. Congress has placed "the location, laying out, construction and maintenance" of roads in the Territory under a board of three army officers. Their last report showed 800 miles of wagon roads, 534 miles of winter sled roads, and 1,100 miles of trails constructed. The best of these, the wagon roads, are in the main only dirt roads, but they are serving well their purpose of rendering habitable a vast country hitherto almost inaccessible.

In the limited time available for the preparation of this paper, I feel that I have not been able to do full justice to the subject, and some inaccuracies may have crept in, though most of my statements are based on official records.

While the army has always kept in touch with the most approved methods of road construction and has done its share toward the development of those methods, the most notable road work of the army has been that of the pioneer in the vanguard of civilization, exploring and opening up routes where no roads existed making possible the advance into the wilderness of the great army of settlers. They and their sons converted the rough early trails into the roads of today and multiplied them exceedingly. It is for us, their grand-

sons, to continue worthily the work they began, to convert our heritage of rough country roads into a nationwide system of modern highways, fully equal to those in older lands and capable of carrying in all weathers, quickly and at little cost, the rapidly increasing traffic that is pouring over them.

National Grange for Federal Aid.

That the movement for federal participation in highway construction is not confined to motorists, but is also being agitated by the farmers, is one of the most hopeful indications of its ultimate success.

On this point the recent convention of the National Grange, Patrons of Husbandry, one of the largest and most influential of the farmers' organizations, took a decidedly favorable stand. Hon. Oliver Wilson, master of the National Grange, in his annual address, stated:

"The public highway is a matter of general concern. The old idea that the country road should be constructed and maintained by the farmer has disappeared. It is now recognized that good roads are of as much importance to the consumer as to the producer, as anything that lessens the cost of transportation is a benefit to the consumer.

"The Grange stands for and advocates federal aid for road improvement. There can be no good reason



A Well-Nigh Perfect Piece of Sand-Clay Near Selma, Alabama, the Work of a Competent Engineer

given why the government should not appropriate money for the maintaining and the improving of the public highway, the same as for our public water ways. Seventy-five per cent. of the product of our country must pass over the public highway before it can be transported over our railway or water systems. While the government has spent millions of dollars for highway improvement in our foreign possessions, it has never appropriated one dollar to be used on the highways in the continental United States.

"The Grange membership is unanimously in favor of congress making suitable appropriations for highway construction and maintenance. This appropriation should be expended by a national highway commission, or board, working in conjunction with similar commissions from the states.

"The legislative committee of the National Grange should be instructed to use all the influence of the Grange upon congress for passage of a bill appropriating a sufficient sum under proper regulations for the improvement of our public highways.

Maryland State Roads Commissioners' System of Accounts

By H. G. SHIRLEY

Chief Engineer, Maryland State Roads Commission

IN THE great rush to build roads quickly, economically and durably, many highway departments of the country have overlooked one of the most important branches of the work, namely, the proper system of accounts.

The accounting system in many instances has grown up with the departments in a loose and slipshod manner, the study and thought not being given it that was given the other branches of the work. After four years of experience in Maryland with the old system of accounts and a number of modifications, it was found inadequate, and on January 25th, 1912, Governor Goldsborough introduced a resolution, which was unanimously passed, appointing a committee to take up this question and to employ expert accountants to audit the books of the committee, so as to show the cost of rights of way, grading, surfacing, culverts, bridges, surveys, plans, the inspection of each piece of work, the cost of machinery, tools, equipment, and the general expense of engineering and administration, along with a recommendation for an up-to-date system of accounting.

Haskins and Sells, certified public accountants, New York and Baltimore, through their local representative, Mr. Edward Fuller, were employed by the committee, and after auditing the books, made an exhaustive study of the subject, visiting the leading highway departments of several states and closely examining in detail the systems of accounts used by each.

After this most thorough examination, and after many consultations with the former Chief Engineer, Mr. W. W. Crosby, and the present Chairman of the Commission, Mr. O. E. Weller, the following system has been adopted.

To meet the present organization, consisting of a commission, a secretary, a counsel, and a chief engineer. The commission is composed of a chairman and five members—the governor also being an ex-officio member. The chairman is in active charge, and all reports are made to him.

The state is divided in two divisions, over which is placed a division engineer, who reports to the chief engineer. Each division is divided in four residencies, consisting of three counties and over each residency is placed a resident engineer, who reports to the division engineer, and is in charge of all work in his residency, consisting of both maintenance and construction.

CLASSIFICATION OF EXPENDITURES.

General Accounts.

- A—Administration and legal.
- B—Engineering.
- C—Preliminary surveys and plans.
- D—Construction.
- E—Reconstruction.
- F—Maintenance.
- G—Equipment.

A—PRIMARY ACCOUNT.

- 1—Commission salaries and expenses.

2—Commission—Secretary's and office employee salaries.

3—Commission—office expenses.

4—Counsel's salary, fees and expenses.

B—ENGINEERING—GENERAL.

101—Engineer's salary and expenses.

102—Office employees—salaries.

103—Office expenses.

104—Shop labor and material.

105—Investigations.

ENGINEERING—PRELIMINARY AND CONSTRUCTION.

110—Engineers' salaries and expenses.

111—Resident engineers' salaries and expenses.

112—Office employees' salaries.

113—Office expenses.

ENGINEERING—RECONSTRUCTION AND MAINTENANCE.

120—Engineers' salaries and expenses.

121—Resident engineers' salaries and expenses.

122—Office employees' salaries.

123—Office expenses.

C—PRELIMINARY SURVEYS AND PLANS.

201—Survey parties.

202—Draftsmen.

D—CONSTRUCTION.

301—Rights of way and damage.

302—Grading.

303—Surfacing.

304—Bridges and Culverts.

305—Underdrains.

306—Advertising.

307—Inspection.

308—Superintendence.

309—Final surveys, plans and estimates.

310—Miscellaneous.

E—RECONSTRUCTION.

401—Labor and material.

402—Team hire and use of equipment.

403—Superintendence.

404—Inspection.

405—Miscellaneous.

F—MAINTENANCE.

501—Labor.

502—Materials.

503—Team hire and use of equipment.

504—Superintendence.

505—Inspection.

506—Miscellaneous.

CLASSIFICATION OF EXPENDITURES FOR CONSTRUCTION, RECONSTRUCTION AND MAINTENANCE.

A—ADMINISTRATION AND LEGAL.

1—Commission salaries and expenses.

To this account should be charged the salaries paid to the members of the commission. Also all expenses



This is a Sandy Road After it Has Received Scientific Treatment By Men Who Know How. On This Particular Stretch, Near Fredericksburg, Maryland, They Used Oyster Shells, But Plain Clay Will Answer the Purpose

of the members of the commission when engaged on the work of the commission, such as railway fares, team and automobile hire, subsistence and incidental expenses.

2—Commission—Secretary's and office employees' salaries.

To this account should be charged all the salaries of the secretary of the commission and all bookkeepers, clerks, stenographers and office boys in the employ of the commission in its main office.

3—Commission office expenses.

To this account should be charged all office expenses of the commission, such as rents, telegrams, telephones, postage, messengers, books, typewriters, adding machines, stationery and office supplies.

4—Counsel's Salary, Fees and Expenses.

To this account should be charged the salary of the counsel and such fees are necessary to be paid other attorneys in the legal proceedings of the commission which, from their nature cannot be charged direct to a particular road or county. Also the travelling, subsistence and other incidental expenses of counsel when engaged on business of the commission.

B—ENGINEERING.

GENERAL

101—Engineer's salary and expenses.

To this account should be charged the salary of the chief engineer and his traveling, subsistence and incidental expenses when engaged on the business of the commission.

102—Office employees—expenses.

To this account should be charged the salaries of the chief engineer's secretary, clerks, stenographers and office boys.

103—Office expenses.

To this account should be charged the office expenses of the chief engineer, such as rents, telegrams, telephones, postage, messengers, books, typewriters, adding machines, stakes, instruments, stationery and office supplies.

104—Shop labor and material.

To this account should be charged the labor and material used in the shop operated under the direction of the chief engineer.

105—Investigations.

To this account should be charged the cost of the time of chemists, physicists, or others engaged under the direction of the chief engineer in conducting tests and investigations, together with the cost of the materials used in connection therewith.

PRELIMINARY AND CONSTRUCTION.

110—Engineers' salaries and expenses.

To this account should be charged the salaries and traveling and incidental expenses of all the engineers engaged exclusively on preliminary or construction work. At present they consist of the first, second and third division engineers.

111—Resident Engineers' salaries and expenses.

To this account should be charged the salaries subsistence and incidental expenses of all resident engineers engaged exclusively on preliminary and construction work.

112—Office employees' salaries.

To this account should be charged the salaries of the clerks, stenographers, office boys, etc., employed in the offices of the first, second and third division engineers.

113—Office Expenses.

To this account should be charged the office expenses of the first, second and third division engineers, consisting of telegrams, telephones, books, typewriters, stationery and office supplies.

MAINTENANCE AND CONSTRUCTION.

120—Engineers' salaries and expenses.

To this account should be charged the salaries and travelling and incidental expenses of engineers engaged exclusively on this class of work. At present they would consist of those of the second division engineer.

121—Resident engineers' salaries and expenses.

To this account should be charged the salaries and travelling and incidental expenses of all resident engineers engaged exclusively on Reconstruction and Maintenance work.

122—Office employees' salaries.

To this account should be charged the salaries of clerks, stenographers, office boys, etc., employed in the office of the second division engineer.

123—Office expenses.

To this account should be charged the office expenses of the second division engineer, consisting of telegrams, telephones, books, typewriters, stationery and office supplies.

C—CONSTRUCTION—PRELIMINARY.

201—Survey parties.

To this account should be charged the salaries and expenses of engineers and their parties in the field, engaged in surveying and locating proposed new roads.

202—Draftsmen.

To this account should be charged the salaries of draftsmen engaged in preparing the plans and drawings for the proposed new roads.

D—CONSTRUCTION.

All construction work should be done under regular contract or force work orders, which should bear distinctive numbers. An account (Form 1) should be opened for each such piece of work, such accounts to be grouped as to funds from which paid and counties in which work is located.

301—Rights of way and damages.

To this account should be charged the cost of land acquired for right of way, expenses of appraisals, expenses of commissioners or arbiters in condemnation proceedings, commissions paid for purchases of additional rights of way, removal of fences, payments for damages or repairs to abutting property, counsel's fees and expenses when specifically applicable to the cost of acquiring certain right of way, and damages paid for delays because of lack of right of way.

302—Grading.

To this account should be charged the cost of grading, including ditch, masonry, culvert and bridge excavation covered by the cross sections and the borrow pits, the cost of operating steam shovels, scrapers and grading outfits, the hire of teams and equipment, rentals for the commission's equipment used and the cost of miscellaneous tools and supplies used on the work. The cost of grading done under contract should be charged to this account from the vouchers in favor of the contractors.

303—Surfacing.

To this account should be charged the cost of all labor employed and material used in surfacing, including the cost of operating stone crushers, spreaders, road rollers, sprinklers and oilers, the hire of teams and equipment, rentals for the commission's equipment used, the cost of miscellaneous tools and supplies used on the work, and in addition to the macadam or actual

surfacing prescribed in the specifications under such head, all paved gutters, curbing, concrete or other breakers across the shoulders, gravel, etc., used for the shoulders, when so used particularly and independently of the grading expressly for the purpose of improving the shoulders, and any material such as sand, cinders or stone dust used as a layer between the sub-grade and the surfacing proper. The cost of surfacing done under contract should be charged to this account from the vouchers in favor of the contractors.

304—Bridges and culverts.

To this account should be charged the cost of labor employed and material used in construction of bridges and culverts, including the hire of teams and equipment, the cost of miscellaneous tools and supplies used on the work, all pipes, boxes, as well as culverts and bridges of all kinds used toward the end of disposing of the storm water coming to the road from above or from the surface of the adjacent lands. The cost of bridging and culverting done under contract should be charged to this account from the vouchers in favor of the contractors.

305—Underdrains.

To this account should be charged the cost of labor employed and material used in the construction of underdrains, V-drains, blind drains, sumps, standard underdrains, and such other devices as are installed for the purpose of taking care of the ground, or sub-surface water, the hire of teams and equipment, and the cost of tools and supplies used on the work. The cost of drain work done under contract should be charged to this account from the vouchers in favor of the contractors.

306—Advertising.

To this account should be charged the cost of advertising the terms under which contracts for the work may be let.

307—Inspection.

To this account should be charged the salaries and expenses of the inspectors of the work.

308—Superintendence.

To this account should be charged the salaries and expenses of superintendents in charge of the work done by the commission's forces.

309—Final surveys, plans and estimates.

To this account should be charged the salaries and expenses of engineers and their parties engaged in making the final surveys, plans, and estimates on the completion of each contract.

310—Miscellaneous.

To this account should be charged rip-rap, tests and such items as are not chargeable under accounts No. 301 to No. 309, inclusive; also the amount of preliminary surveys and plans applicable to each contract when transferred from accounts No. 201 and No. 202.

All items of \$50 and over should have explanatory notes made opposite the item in the detail ledger.

E—RECONSTRUCTION.

401—Labor and Materials.

To this account should be charged the cost of labor employed and materials used in reconstruction of roads and turnpikes acquired.

402—Team Hire and Use of Equipment.

To this account should be charged the payments for hire of teams and equipment and a rental for the use of the Commission's equipment on the work. It should include the labor employed and materials used in operating and maintaining the equipment in use.

403—Superintendence.

To this account should be charged the salaries and

expenses of superintendents and foremen in charge of reconstruction work.

404—Inspection.

To this account should be charged the salaries and expenses of inspectors engaged on work of reconstruction.

405—Miscellaneous.

To this account should be charged tests and such other items as are not chargeable under accounts No. 401 to No. 404, inclusive; all items of \$50 and over should have explanatory notes made opposite the item in the detail ledger.

F—MAINTENANCE.

501—Labor.

To this account should be charged the cost of labor employed in maintaining existing roads.

502—Materials.

To this account should be charged the cost of materials used in the maintenance of existing roads.

503—Team Hire and Use of Equipment.

To this account should be charged payments for use of teams and equipment in the maintenance of exist-



This Sand-Clay Road in Marion County, South Carolina, is Only a Few Days Old But it is Already Packed Hard. The Motor Truck is the Property of the County

ing roads, together with a rental for the use of the commission's equipment so used.

504—Superintendence.

To this account should be charged the salaries and expenses of superintendents and foremen engaged on maintenance work.

505—Inspection.

To this account should be charged the salaries and expenses of inspectors engaged on this work.

506—Miscellaneous.

To this account should be charged tests and such other items as are not chargeable under accounts No. 401 to No. 404, inclusive; all items of \$50 and over should have explanatory notes made opposite the item in the detail ledger.

G—EQUIPMENT.

To this accounts should be charged the purchase price of all equipment which may have a substantial value after it has been used on any particular piece of work, such as road rollers, crushers, scrapers, graders, sprinklers, horses and wagons, auto trucks, etc. Small tools and other equipment which quickly wear out or become valueless should be charged to the work for which purchased at the time of purchase and upon the

completion of such work should be appraised and credited to it.

The commission's equipment should be inventoried and numbered, and a proper record kept thereof. Charges for the use of the equipment should be made against the work on which it is employed the credits for which may be carried in a "Depreciation Reserve" or "Rental" account.

It is possible at any time, with this system of accounting and without any inconvenience to the book-keeper, to show exactly how much money has been expended on any contract or work in any county of the state. This system eliminates to a certain extent the journal which is only used when it is impossible to make a direct charge to a certain county or contract. Force account work is kept in the detailed ledger but a separate ledger is kept for payments to contractors, which are posted from the cash disbursement book. Equipment is numbered and charged against the work on which it is used. Credits for equipment are carried in a depreciation reserve or rental account. Small tools are charged to the work on which they are used and upon completion of the work are appraised and credited to it.

In comparing this system of accounts with those used in other states, it will be noticed that the appropriation bills as passed in Maryland are very much more exacting than those in New Jersey or Massachusetts. The appropriations are made for definite work, leaving very little discretionary power with the commission, the State Road Fund being allotted by statute in proportion to the road mileage in each county. The state No. 1

fund is for the improvement of the Washington Road leading from Baltimore to Washington, and known as state road No. 1.

The roads and bridges fund is appropriated for construction and rebuilding certain roads and bridges named in the appropriation bill, and the state aid fund is used where the county officials petition the state roads commission to have certain roads improved, of which the state pays one-half of the cost and the work is done under the commission's supervision.

Having four separate and distinct funds to expend necessitates a more elaborate system of accounts than is necessary in New Jersey or Massachusetts.

In New Jersey, the money is spent under the direction of the State Highway Commissioner and is derived from an annual appropriation and from the motor vehicle tax. All construction work is done by contract and accordingly the commissioner has no equipment and in that respect differs from the Maryland Commission. The entire fund is a State Aid Fund, and the counties are required to bear two-thirds of the expense of road building. It is discretionary with the Board of Public Roads how the appropriations shall be allotted and they are compelled to confine themselves to the road mileage of the different counties of the state. Payments are made to the counties when the contracts have been completed and accepted, by a request from the commissioner on the Comptroller to issue the warrant. The commissioner handles no money but pays everything through the Comptroller, making a very simple system of accounting. The state makes a separate appropriation for the salaries of the commission-



A Typical Wilkes County, North Carolina, Road as They Were. The Jefferson-North Wilkesboro Pike



Turnpike Between Wilkesboro and North Wilkesboro, North Carolina, Showing How Wilkes County is Coming Out of the Mud

er, the general supervisor, the assistant supervisor and the office force.

The costs of roads as compiled by the engineers includes the salaries of the supervisors and engineers engaged exclusively on the work. No attempt is made to apportion the cost of the general engineering, supervision and administration to the cost of roads.

In Massachusetts, the money spent under the direction of the commission is derived from appropriations from the state and from the motor vehicle tax. All construction work is done by contract either with a town or with a contractor, the towns being given the first chance to do the work at certain prices. The entire work is absolutely under its jurisdiction, the law giving the commission considerable latitude in expenditures, requiring only that it shall be equitably divided among the various towns. The commission makes the allotments and memorandum totals of these allotments are carried along in its records merely for the purpose of seeing that they are not exceeded.

The salaries of the commission, the chief engineer, and his two assistants do not enter into the cost of the construction. As the commission does no construction work itself, it has no construction equipment. It does, however, have repair and maintenance equipment of which it keeps a card record. No charge is made to maintenance of roads for the use of such equipment. The commission keeps records of all expenditures under its construction appropriation by contract numbers which are brought together on a sheet and the expenditures segregated under the headings "Contract Bills," "Miscellaneous Items," "Weighing," "Resident Engineer" and "Engineers," the latter two items coming in by annual pro rata. In a similar manner, the repairs and maintenance are brought together.

The system adopted in Maryland is more elaborate than the ones used in New Jersey or Massachusetts, owing to the greater number of funds with which it has to deal, but it is so simple, accurate and flexible that it can be applied to any accounting system with beneficial results. The merits of this system are simplicity, accuracy, cheapness of operation and the large amount of cost data given. It is estimated that at least 50 per cent of the cost of keeping accounts under the old and generally used system has been eliminated and the amount of accurate and detailed information given increased 100 per cent.

After the system has been installed, almost any clerk of average ability can carry it on and at the end of each month make a detailed report, showing the receipts and disbursements in each county of the state.

The J. I. Case Threshing Machine Company, of Racine, Wis., is jubilating over the great showing made by Entry No. 27 in the Winnipeg Motor Contest. This entry was a 110-Horse power Case engine and the engine not only won the gold medal for scoring the highest number of points in its class, but won the sweepstakes honors by scoring more points than any other competitor in the whole contest, irrespective of class. By clerical error the published figures immediately after the contest, gave the Case engine a score of 442.85 and it should have read 457.85. The company is circulating a facsimile copy of a letter from the judges of this contest, L. W. Chase, A. R. Greig, A. C. Frith and M. L. King, correcting the error and expressing their regret therefor.

The Butler county, Alabama, commissioners are preparing to build two reinforced concrete bridges



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VOLUME VII.

With the new year Southern Good Roads entered volume seven with higher hopes, a stronger constituency and a richer field before it than it has ever had before. There have been times in the history of the magazine when the struggle seemed hopeless; the progress made was so heartbreakingly slow, the distance to the goal was so great and the obstacles to overcome were so formidable that in moments of discouragement the temptation was strong to abandon the fight in disgust. But a glance backward over the years since the establishment of the periodical shows that such a view was always unjustifiable; the South still lacks much of having the road system that she ought to have and that she must have if she is to keep her rightful place in the forefront of the progressive nation, but in contrast with the decades of apathy that preceded them, the progress made within the past few years is nothing short of marvelous. The South is making greater strides in road-building than any other section and as the cause gathers momentum its rate of progress will steadily increase. The start has been made; the inertia of a century and a half has been overcome and the good roads propaganda set in motion. The most difficult part of the undertaking has been accomplished and

there remains only the infinitely easier task of keeping it going. The South is building better roads and with them are coming the legion of blessings that always follow in their train—better farms, better schools, better churches and a better and happier citizenship.

Of course it would be absurd for Southern Good Roads to claim all the credit for this; but if it did not know that it had been trying to help and if it did not believe that it had actually helped to some degree, it would have no excuse for existence. But it does know and it does believe and therefore it is with honest pride and high hopes that it wishes all its co-laborers a Happy New Year.

A PRAYER FOR RELIEF.

North Carolina has done wonders in road-building within the past few years when one considers the handicaps under which she has worked, and if those handicaps could be removed she would soon be in the front rank of progressive states along that line. The General Assembly, now in session, has an unparalleled opportunity to benefit the state in that way, and if it does not take advantage of that opportunity the state must inevitably drop behind. The present system of leaving the problem of highway building solely with the counties is obsolete and to continue it is to strangle all future prospects. North Carolina must have an adequate State Highway Department—and the word “adequate” excludes ward heelers and “lame duck” politicians; it must be composed of engineers and financiers who know their business and who are able intelligently to handle the problem of the state’s highway system. The coming of the automobile has raised the road problem out of the plane of county matters; it is a state problem and must be handled by state authorities if it is ever to be settled satisfactorily.

Furthermore, nothing human is more certain than the eventual arrival of federal aid for highway construction; but the national government is properly cautious about where it places its funds, and unless North Carolina has some regularly constituted state authority to deal with the national officials she will most certainly be excluded from participation in the benefits of federal aid when it does come. Again the state as a whole has a peculiar interest in certain projects that in all probability will never be brought to a successful conclusion without its aid. Notable among these is the Crest of the Blue Ridge Highway; the completion of this road will mean an enormous tourist travel which will bring millions of money to North Carolina. But its location, on the very top of the highest mountains east of the Rockies, while giving the road its value as a scenic route at the same time make its construction tremendously expensive—so expensive, in fact, that it is out of the question for the sparsely-settled communities through which it will run to furnish all the funds. On the other hand, the building of the road will mean an almost incredible increase in the value of property

along it and the increased taxes that will accrue to the state would make the road a good investment.

This is only one of numberless problems that are coming up every day which can be satisfactorily handled only by a State Highway Commission. The State Geologic and Economic Survey has been doing noble work along this line but with the multitude of duties which have been thrust upon it is impossible for this department to fill the need, even if it had the legal backing which it has not, to make its instructions authoritative.

It is patent to the most superficial observer that some road legislation must be enacted, and that right soon, by the legislature of North Carolina; but under present conditions we respectfully submit that the General Assembly is sadly at sea with regard to what ought to be done. This, though, is self-evident—the state must introduce more system into its road work, it must have some authority whose word will be final, whose opinion will carry weight and whose information will be detailed, inclusive and unquestionably accurate. Without this official head it is struggling under a stifling handicap from which the legislature now sitting can very easily release it. If it does so it will have taken a long step forward toward making North Carolina the wideawake, progressive state she ought to be.

ROAD PROGRESS IN 1912.

The year just closed has been a notable one from the point of view of the good roads advocates of the land. A great many states, north and south, have increased their appropriations for roads and the state aid idea has grown until but few of the states are without some form of state aid. In many states steps are being taken to increase the powers and enlarge the scope of the state highway departments and the legislatures that are to meet this winter and spring may be depended on to respond to the popular sentiment that has grown so steadily since the beginning of the year.

In all parts of the south bond issues have been voted. Road districts composed of two or more townships, single townships and counties, have voted bonds for road-building running well into the millions of dollars. In Texas, for instance, \$10,150,000 was made available for road work in 1912, this amount being made up of bond issues for more than \$6,000,000 and special road taxes amounting to more than \$4,000,000. While other southern states have not done as well as Texas, progress has been marked in all.

Mr. H. L. Ramsey, secretary of the Lakes-to-the-Gulf Highway, has published some interesting data showing many interesting phases of road progress. His report shows that in 1912 nine states of the union spent not less than a million dollars on road-building. These were California, Connecticut, Massachusetts, New York, Ohio, Iowa, Oregon, Pennsylvania and Washington.

Of the states that have taken great strides forward

in the building of roads, New York is easily first. At the November elections an additional bond issue of \$50,000,000 was voted by an overwhelming majority. New York state is thoroughly alive to her need of good roads and her citizens are determined to have them. A few years ago they voted \$50,000,000 for the same purpose and, while many miles of good roads were constructed, millions of dollars of the people's money went into the pockets of Tammany grafters and was ruthlessly squandered to provide soft snaps for political "lame ducks" and disabled ward heelers. Undismayed by this experience, they tackled the problem anew and will spend another \$50,000,000 in road-building. This time they saw to it that a man of undoubted and unquestioned honesty was elected governor of the state and they are depending on him to protect them. William Sulzer will do it, too, if any one can.

In California a bond issue of \$18,000,000 is now being carefully and economically expended. Before the Panama Exposition opens in 1915, that state will be gridironed with roads of the highest type, reaching every point of interest in that state of interesting things, all radiating from San Francisco.

In Pennsylvania a great campaign has been carried on for a bond issue of \$50,000,000 and there is not the slightest reason to believe that it will fail of passage by the coming legislature. The people of the state are for it.

In Maine a bond issue of \$2,000,000 has been authorized and in a score of other states smaller appropriations have been made. In the south road activity has been limited mainly to the individual counties, though Maryland, Virginia and Alabama have arranged for large annual appropriations for the building of state roads. Other states, notably North Carolina, Georgia and Tennessee, will get in line before many months have passed and perhaps several others will also be found in the state aid column.

During the year there were a number of notable good roads conventions. First in importance was the great American Road Congress held at Atlantic City, which brought together the greatest array of good roads advocates ever assembled in this country. Early in the year the American Association for Highway Improvement, now known as the American Highway Association, joined with the American Automobile Association, at the invitation of the latter, to hold a federal aid convention in Washington. This meeting was addressed by Hon. Oscar W. Underwood, majority leader in the House, Senator Swanson, of Virginia, and a number of the leading law-makers of the nation. The convention decided that congress should name a committee representing both the senate and the house of representatives, to study the question of federal aid and to recommend a federal aid program to congress. Representative Underwood framed and introduced a bill exactly meeting the desires of the convention and it was passed. Another bill carried an appropriation of \$500,-

000 for experimental work in road-building. In December the American Road Builders' Association held its annual convention at Cincinnati. This gathering brought together several hundred good roads enthusiasts and a great deal of good was accomplished.

Altogether the year 1912 was a great one from a good roads standpoint. The trend was onward and upward the entire year through and there was but one set-back anywhere along the line. That was the defeat of the amendment to the Ohio constitution to provide for \$50,000,000 of bonds for the building of good roads. Good roads advocates in the south have every reason for rejoicing and are looking to the future with renewed hope and confidence. The year that is beginning will usher in the greatest era of road improvement the nation has ever known.

Beginning of Good Road Work in Wilkes County.

The two cuts of Wilkes county roads shown in this issue will illustrate the need of good roads and the measures that are just being started to remedy the evil of bad roads in western North Carolina.

The first cut is of a clay dirt road, badly rutted and almost impassable except as it is being brought into shape by means of a small grader. This, however, is only temporary. The other cut is of a new macadam road recently completed between North Wilkesboro and Wilkesboro, and any one driving over this road will at once realize the value and benefit of a good road. On one you can haul a load as large as the wagon will hold, and over the other you can haul practically no load at all.

Wilkes county is one of the better agricultural and horticultural counties of the state, and the only thing that is preventing the development of these resources to the best advantage is the lack of good roads. May the construction of good roads in this county continue until all parts are connected by good roads.

Massachusetts Commissioner Approves Federal Aid Idea.

Among the communications received by Chairman G. C. Diehl of the American Automobile Association's national good roads' board is one from State Highway Commissioner Sohier of Massachusetts, a state wherein road construction and maintenance have been reduced to a science. He frankly confesses that he is very much interested in the federal aid subject, particularly in how the money should be spent. Commissioner Sohier contends that it is absolutely essential "that the money should be spent upon a small enough number of roads so that there will be sufficient money available to make the expenditure show for something and be worth something, not only for one year, but for a reasonable series of years." Referring to the roads which would come under the head of "National" to be improved, constructed or maintained the commissioner believes that the work should be under control of a representative of the national government, and a representative from the state, such selection of roads to be safeguarded from any semblance of the "pork barrel" proposition.

State Engineer Lea of South Dakota, a state in which the roads question is of comparatively recent agitation, makes this pertinent comment: "We are making special efforts toward the establishment of trunk line

roads across the state. It is expected that later on tributary roads will be built to the trunk roads, thus providing a complete road system for the state. We are advancing in South Dakota because of the better understanding by the farmers of the roads question. The problem of the relation between federal aid and the work that is being done by the states themselves would be answered by having harmonious co-operation between federal and state departments."

It is no longer debatable that the million users of the motor-driven vehicles throughout the country are responsible for adding a new factor in the problem of transportation and the necessity for improved roads. While the use of automobiles has widened the area of travel, in many sections local travel for the most part is still drawn by horses. This traffic revolution makes necessary a new basis of computation for apportioning the expense of the necessary improvement of the highways. Chairman Diehl summarizes the situation in these words:

"There are certain main roads in every community leading to county seats and very populous centers, the cost of which it would be unjust to tax upon townships, for the usefulness of these roads under the new conditions includes the county as a whole. Consequently each township, and incidentally each property owner, should only pay his proper share in the improvement of this class of highways. The wider area of travel makes necessary the opening of improved highways between county seats, leading to populous centers, and important marketing points.

"The same relation which exists between the town and county, and between the county and state in the improvement of certain classes of highways, should exist between each state and the federal government. Highways of an interstate character, those leading from the capital of one state to the capital of another; those trunk lines leading to great centers of population; to points of public interest; to popular resorts; in fact any highway the major portion of the mileage travel over which originates outside the state, should properly be constructed at the expense of the federal government."

An asphaltic product now attracting the attention of many Southern road-builders is the C. M. Fuller Company's Adeline Asphaltum. The company sells it as 80 per cent asphaltic oil but a disinterested analysis shows that it contains a much greater proportion of bitumen. A sample of the oil was taken from the pit in which it was being heated for use on the model highway under construction between New Iberia and Jeanerette, La., and an analysis was made for the Louisiana State Highways Commission by Mr. J. C. Mims, an eminent analytical and industrial chemist of New Orleans. His analysis showed moisture and loss at 100 C. of 2.22 per cent; Petrolene, bitumen soluble in acetone, 94.99 per cent; Asphaltene, bitumen soluble in chloroform, 2.49; Non-bituminous organic matter, 0.19 per cent; Ash, 0.11.

Harry Brothers, manufacturers of famous open hearth metal culverts, issue monthly from their home office in Newport, Ky., a little publication called *The Road Supervisor*. It is more than an advertising sheet, though it is an advertiser, all right, and always contains a lot of information worth a great deal to road-builders. Their December number was handsomely gotten up and even more interesting than usual.

The Making of Road Surveys

By E. L. GRIGGS

Associate Professor C. E. University of Georgia

In making surveys of highways the engineer meets largely the same problems that he does in railroad surveys and uses largely the same methods of solving them. While the highway engineer has broader limits in which to work than has the railroad engineer, in that his grades may be heavier and his curves sharper and more frequent, yet the question of cost restricts him in nearly all cases. He has to so locate his road that its cost will be a minimum, even though he has sometimes to wind around a hill when he would prefer to cut through. And he must not forget that he hasn't the steel rails of his brother of the railroad on which to carry his traffic, but instead a cheap surfacing material which we must protect from water at all times. He must never put his road in long cuts, however nice the location, but rather break his grade and bring the road to the surface that the side ditches may be emptied.

I shall, however, not go into the question of the location of roads but will consider the actual field survey necessarily precedent to the proper construction of the road.

Before a survey of a road is made it should be known how the construction of it is to be carried out as that determines in a large measure how much engineering work should be done.

If the road is to be constructed by contract, and especially if the consideration is based on a price per yard of material handled, then justice to both parties to the contract demands a full and most accurate survey and determination of volumes.

While to take the other extreme, if a county is building its roads with its own labor, convicts for example, much less engineering work may be done. The question of exact cost in this case is not so important and the determination of volumes is for construction purposes only.

Preliminary to the final decision of the location of a new road or, what is nearly equivalent, a radical relocation of an old road, a thorough study of all the feasible routes is essential. For this purpose a most useful instrument is the plane Table or Traverse Table. We use the simplest form for this purpose which is fourteen inches square and weighs only a few pounds. With its aid all the probable lines are gone over and plotted, the distances being obtained with sufficient accuracy by pacing, while any determining features such as residences, ridges, streams, etc., are triangulated in. Property lines crossed are also noted as bearing on the question of rights of way over the individual properties. A useful adjunct to the plane table in this preliminary study is a good hand level, with which comparative elevations of ridges, etc., passed over are very conveniently estimated and then noted on the map.

This work requires only one man for its execution and equipped with only these light instruments he can cover considerable ground in a day. If he is careful to make copious notes on the map it will show when completed not only the lengths and directions of the lines, but also the character of the country over which the road would pass and the number of homesteads

served. This latter is, of course, one of the really governing features of the final selection. This may also furnish facts that the engineer must sometimes have to answer a too persistent patron who has personal ends to serve.

After this preliminary work is completed and the final selection of the location is made then we are ready to actually stake out the road.

If the road is to be constructed by contract then the regular work of a railroad survey should be done. The line should be carefully measured and staked, levels run and profile made, cross-sections taken, slope stakes set and volumes accurately determined. All these operations are essential to a just settlement of the contract but they entail heavy engineering expenses.

In the State of Georgia, as in some of the other states, most of the roads are built by convict labor and here such reasons for great accuracy do not exist and quicker and more economical engineering methods may be used. For it is of far greater importance that a road should have easy grades, perfect protection from water and a good surface than its curves, for example, should be theoretically correct. If a road is so located and graded that the material taken from the cuts will just make the fills why should we bother about the exact number of yards of material handled? Short sharp curves and quick reverse curves are both disagreeable and dangerous with rapid automobile traffic and are to be avoided.

In making our road surveys the road is staked out by a transit party in the usual manner of staking out a railroad location. The stakes are set every hundred feet but on one side instead of the center of the road so that they will not be disturbed in construction. Long curves, however, can be put in much more economically in point of time by setting the stakes over on offsets from the tangents. For instance, for a two station curve the previous tangent is prolonged straight one hundred feet to the vertex, the angle with the forward tangent measured and the degree of curve decided upon. The stake at the vertex is then moved over on the curve. The distance the stake is moved over is equal to 1.75 feet for every degree of deflection or two degrees of curve. For example, if the angle between the tangents is sixteen degrees, then the curve will be eight degrees and the stake at the vertex will be moved over four times 1.75 feet, or seven feet. The effect of this is to put the stake exactly on the curve, but the forward tangent will be found 0.6 foot from the position it would have occupied if it had been laid out in the regular way, the curve shortened between one and two feet from the recorded length, and the degree of curve slightly changed.

If, however, the central angle was larger and four stations of an eight degree curve decided upon, then the stakes at stations one and three would be set over seven feet, while the stake at the vertex would be set over four times seven, or twenty-eight feet, since the offset varies directly as the square of the distance in 100 foot lengths. That is, at station two the distance set over would be four times that at station one, and at station three, in a six station curve, it would be nine

times that at station one. Very little time, however, is saved in using this method for curves over four hundred feet long.

In the case of the four station eight degree curve mentioned above the near half of the curve is almost exactly located while the forward tangent is again found away from its theoretical position, about five feet in this case, and the whole curve shortened about ten feet from its recorded length. This difference of about two and one-half feet in one hundred will not affect the grade and it is also to be remembered that it is not cumulative but rather balancing. For if the curve is staked out on the outside of the curve and a center line afterwards measured it will be found that the centre line to the point of tangency is still shorter than the curve as staked out. This will tend to balance when the curve is staked on the inside.

Another very convenient method of laying out a curve and especially if one happens to be without his instrument, is one derived from the method given by Searles in his *Field Engineering*. At the point of curvature the previous tangent is prolonged one hundred feet further and perpendicular to it at its end and in the direction of the proposed curve is laid off a distance equal to 1.75 ft. times on half the proposed degree of curve for the first station of the curve. For the second station, and all succeeding stations, the line through the two preceding stakes is prolonged one hundred feet and perpendicular to it is laid off a distance equal to twice that for the first station or 1.75 feet for every degree of curve. In order to get on the tangent at the end of the curve the line of the last two stakes is prolonged one hundred feet and the perpendicular laid off is equal to the one laid off at station one. For example, if we propose to use an eight degree curve the perpendicular laid off for the first station of the curve after leaving the tangent and for the first station on the forward tangent would be 1.75 feet times one-half of eight, or seven feet, and for all other stations it would be 1.75 feet times eight, or fourteen feet.

The transit party also determines accurately the location of the property lines crossed, so that the exact area of the right of way on each separate piece of property may be found.

After the line has been staked out the level party goes over it and takes levels, the rod being held on the ground by the stakes. Levels are also taken at the opposite side of the road, the width of the road being measured by pacing. Profiles are made of each side of the road approximately paralleling each other on the same piece of profile paper. This will give sufficient information to very closely approximate the balancing of the cuts and fills without the necessity of cross-sectioning.

No slope stakes are set, as the cuts are usually light. The road bed is graded down to its proper depth and the banks afterwards shaped up.

We have sometimes carried out the whole operation of surveying a road with a party of only three men; an instrument man carrying a transit equipped with level tube and stadia hairs, a rodman carrying a self-reading level rod and a stakeman.

The instrument man, after he has set up his instrument and gotten his alignment, signals the rodman forward or backward until he is the proper distance away as shown by the stadia, then lines the rod in for the exact position of the stake. After this is driven he determines the elevation of the station by using his in-

strument as a level. As the distances are usually in hundreds of feet and the telescope horizontal no stadia notes will have to be kept or reduced. If the ground is practically level transversely no further level need to be taken, but if not the rodman must return, after going as far as the rod can be read, and holds his rod on the opposite side of the road. This method is very laborious and subject to errors by the instrument man overlooking some of his manifold operations and is suggested only for short pieces of work or when assistants cannot be had.

The stakes, are of course, numbered when set and if the foreman of construction is an experienced man he is simply furnished with a profile with the cuts and fills for each station written on it, or merely a list of the stations with the amounts of the cuts and fills. If he is not so experienced he will require considerably more supervision by the engineer.

Some may infer from what has been said, that since certain approximations in the surveys are to be used, the services of the engineer may be dispensed with as unnecessary and the road located by the eye alone. Such, however, is very undesirable. The knowledge, judgment and experience of an engineer are always needed for the proper location of a road and the responsibility should be his for grading the road and so balancing the cuts and fills, yet keeping within the limits of allowed grade, that the minimum amount of earth will be handled, and for placing proper culverts that the storm water may be at all times taken care of.

Experience has shown that the cost of construction is often very materially increased by not having proper grade stakes set beforehand. As an example, on one occasion in grading a hill, six inches seemed enough to take off. So it was plowed to this depth and the dirt hauled to the next fill and the road shaped up. The grade still did not look right and it was plowed six inches more, the dirt hauled down and the road shaped up. If grade stakes had been set at the beginning this plowing would have been done at one time and the road shaped but once, thus saving the cost of the whole construction force for some time. Again, in a piece of side hill work, the road authorities without consulting an engineer, decided that the road should be built at a certain elevation. They thought that a shallow cut there and a slight fill at the bottom of the hill would give them an easy grade. The result was a very deep cut, a very steep grade and greatly increased cost, when all their expectations might have been gained if the road had been located a little further down hill in the beginning.

Even in flat sections the eye is often deceived and where there seems sufficient grade for drainage there often develop low places in the road which hold water after rains.

'Tis folly to expect to gather figs from thistles but not more than to argue with a man who prides himself on his opposition to good roads.

Senator H. B. Terrell, of McLennan county, Texas, has given notice that at the approaching session of the Texas legislature he will introduce a bill, to establish a state highway commission for the Lone Star State.

When mud-holes begin increasingly to appear in the roads leading to a city it is easy to foresee that grass will soon be growing in its streets.

GOOD ROADS NOTES

GATHERED HERE *and* THERE

Arkansas.

The official call has been issued for the eleventh annual convention of the Arkansas Good Roads and Drainage Association, which will meet in Little Rock January 23 and 24. The following information in regard to the meeting is included in the official "call":

All judges, highway commissioners, road commissioners and road overseers are members of this association.

All public spirited citizens, farmers, mechanics, merchants, and professional men are cordially invited to attend and participate. All county judges are urged to appoint 10 delegates and 10 alternates.

All mayors are requested and urged to appoint 10 delegates and 10 alternates.

All good roads and drainage associations are requested to appoint full representation of their organization to attend the convention.

There will be reduced rates on all railroads. The legislature will be in session during the convention and every accommodation will be afforded delegates and visitors.

The state convention of county judges will be held on January 22, the day preceding the convening of this convention. All county judges are delegates.

At Prescott, Nevada county, there was a stirring and enthusiastic good roads convention December 30. Nearly all of the overseers of the county were in attendance. County Judge Thomas, of Nevada county, was the presiding officer. Judge Joe Asher, of Pulaski county, Senator Holt, Hon. W. Y. Foster, of Hempstead county, and many other good road boosters were present. A banquet at the Park Hotel was tendered the visitors by the Prescott business men. After the banquet Judge Asher, Senator Holt, Mr. Foster, Col. Thomas C. McRae, Col. C. C. Hamby and W. W. Pfrimmer made short addresses. Hon. W. V. Tompkins was toastmaster.

A resolution to the legislature asking for a law regulating width of wagon tires was adopted. After an interesting session the convention adjourned to meet again Dec. 30 and 31, 1913.

The approaching session of the legislature is to be the occasion of a warm fight for good roads. The advocates of better highways are lining up and it is believed that some real good roads legislation will result. Representative A. V. Smith, of Bradley county, will introduce a bill creating a State Land, Highway and Improvement Commission.

It is proposed in the bill by Representative Smith to use the present state land office to create the new department. According to the measure to be introduced, to the land office will be added the highway and improvement duties.

The election of a State commissioner to preside over the office is proposed. The bill also provides for the governor to appoint four other commissioners. The elected commissioner is to serve as chairman of the board. This board will have power to select road engineers and other officers necessary to carry out the work.

"This office would be practically self-sustaining,"

said Representative Smith. "The income of the land office at present is \$35,000, and this amount could easily support the new commission."

* * *

Alabama.

Authority to increase or decrease the salary of State Highway Engineer Walter S. Keller is vested in the state's highway commission, and he is not a state official, but an employe of the commission, according to public examiner Frank V. Evans, who filed a report with Governor O'Neal recently on examination of books of the highway department. Attorney General Robert C. Brickell, in an opinion furnished the examiner, held that the commission had authority to increase Engineer Keller's salary from \$3000 to \$4000, beginning January 1.

"The attorney general holds that the highway engineer is not an officer of the state," said the examiner, "but an employe of the highway commission and that therefore this increase of salary during the term (indefinite) for which he was appointed is not contrary to section 281 of the constitution," Section 281 prohibits the changing of a state official's salary while he is in office.

Expenses of the department during the period between April 1, 1911, and October 1, 1912, outside of general appropriations to counties, were \$14,447.76. Money paid to counties for highway improvement works aggregated \$49,546.34. Since October 1 many applications for money have been granted and disbursements would be greater if the report were of a period up to January 1.

* * *

Colorado.

Arrangements are now being made for the third annual convention of the Colorado Good Roads Association which will be held in Denver during the early part of January. The meeting will immediately precede the annual convention of the County Commissioners' Association of Colorado.

In this convention the representation will be largely by membership, i. e. those holding membership cards in the association will be delegates without regard to appointment to represent any city, town or commercial organization.

At the present time the association numbers almost 1,500 and represents practically every county in the state. In many counties, however, this membership is not as representative as it should be, and an active campaign will be carried on in those sections for more members.

The convention will consider road legislation which will be presented to the next general assembly, which will then be in session. The main issue to be discussed, however, will be now to secure the necessary funds for state road building, and thus avoid having funds tied up which should be used for work in this state. A wide tire bill, designed to prevent wear and tear on roads and to aid in the maintenance of highways, is also one of the measures to be considered.

Governor-elect Ammons, a native of North Carolina,

is one of the most enthusiastic road builders ever in the state house. He is heartily in sympathy with the good roads movement in Colorado and will be one of the principal speakers at the January convention.

* * *

Florida.

Sheriff Will C. Spencer, of Hillsborough county, who took the oath of office January 7th, at Tampa, went into office under unique conditions. He was elected on the promise that he would take from the fees of that office but \$3,000 per year, and after paying the salaries of his deputies and other office expenses, would, at the end of each month turn over to the county, through a committee to which he will render an accounting each month, all other monies received through the office in fees for the county road fund.

If the current report that the sheriff's office has been netting the incumbent about \$15,000 per year, be true, Mr. Spencer will have something like \$12,000 per year to turn back to the county.

In a recent number the Manufacturers' Record reviewed the needs of Florida in the way of roads, calling attention especially to two badly needed motor roads, saying:

It is reasonably safe to say that if there were two first-class motor roads, one from Jacksonville to Miami and one from Jacksonville to the West Coast, there would be almost an unbroken line of automobiles to be seen on these roads during the entire winter. New England with its splendid roads and its fine summer climate draws tens of thousands of motorists who annually leave in that section many millions of dollars. Indeed, it has been carefully estimated by railroad men that the tourist business yields to New England an annual crop of \$60,000,000. This is probably a conservative estimate. Moreover, it is increasing more rapidly probably than any other crop in the country. New England does not appeal to the motorist for a summer trip so strongly as Florida would appeal to the motorist for a winter trip, if two main highways, well constructed, existed in Florida, one down the East Coast and one to the West Coast. The tourist business to Florida is capable of indefinite development. It is possible by active work on the part of the people and the railroads to easily quadruple the tourist travel to that state, as great as it is now is. The powerful factor in accomplishing this would be good roads.

* * *

Louisiana.

Under the caption, "Caddo to Spend Fortune on Highways from Shreveport," the New Orleans Picayune has the following to say of next year's plans in Caddo parish for adding about twenty-five miles of permanent highways to the system of good roads started from Shreveport in 1912:

"For the purpose of building and maintaining better roads the parish of Caddo proposed to expend \$125,000 and has called on the state for its aid and the usual quota that is donated, which will be approximately one-third of the sum appropriated by the parish for good roads. State Highway Engineer Atkinson stated that early in the new year engineers would immediately begin to make surveys in the parish to build the roads wanted by the police jury.

"No definite plans have been advanced by the jury as to what road they want built, but in all probability they will require roads running out of Shreveport

through the oil fields and to the various borders of the parish.

"The roads will probably be built of sand and gravel, which will be taken from the Red river basin and placed on a base of red clay, which well packed, makes an admirable foundation. All the roads will be built according to the regulations of the state highway department, which calls for roadbeds thirty-six feet in width. The drainage will consist of the road being banked to the center and drained into ample ditches on either side, the road itself being cut by culverts about every 300 yards."

* * *

Michigan.

The cold weather has compelled the state highway department of Michigan to cease road construction for the year. More miles of road were laid in 1912 than ever before in the history of the department. In all the state has built about 1,600 miles since the department was created in 1905 and the state authorized to pay a reward for roads built under its provision. This year the department has built about 600 miles of road. Most of this has been built since July 1.

When the law first became operative the macadam roads proved the most popular but now the demand is heaviest for gravel roads. Highway Commissioner Ely attributes this to the fact that the state reward roads are becoming more popular among the farmers. The law requires that gravel roads shall have a nine-foot track and eight inches of gravel. The state allows \$500 per mile. The commissioner says the gravel roads are excellent and that he prefers them to macadam roads, where the traffic is not heavy.

The department has applications for about 700 miles of state road already for 1913.

* * *

New York.

In every county of the state evidences are plentiful of a public sentiment which will support Governor Sulzer to the utmost in his promised endeavor to safeguard the expenditure of the \$50,000,000 voted for good roads.

Although Governor Sulzer has not, as yet, revealed his plans in detail, a strong, state-wide impression exists that he is preparing to meet the grave emergency in highway affairs with peculiarly drastic measures aiming at a two-fold outcome:

First, a thorough reorganization of the Highways Department so as to take it completely out of politics and to place it on a basis of genuine efficiency.

Second, to searchingly investigate the entire highways situation, unmasking the influences that have put millions of dollars into the pockets of organized grafters and bringing the guilty, individually, to exposure and punishment.

* * *

North Carolina.

The State Board of Agriculture which met in Raleigh December 5th, among other resolutions, adopted one asking the legislature to take such action as will provide for the working of all able-bodied convicts on the public highways. This is in accordance with the resolution passed by the North Carolina Good Roads Association at its Annual Convention in Charlotte August 1 and 2, which reads as follows:

"Resolved. That it is the sense of this convention that all convicts who are suitable for road work should be used in the construction of public roads and that

they should be worked under the supervision of a Highway Commission or under the Highway Division of the North Carolina Geological and Economic Survey; and that their guarding and care should be under the supervision of the Superintendent of the State's Prison. Provided, That it shall not apply in any way to the present method of working county convicts in their own county.

"That we condemn the system of leasing convicts to corporations or using them in the construction of any railways or for other private interests.

"Resolved, further, That until there is a change in the methods of working the state convicts, all profit derived from the penitentiary should be used in building public roads by a State Highway Commission or the North Carolina Geological and Economic Survey."

A striking example of the interest that is being felt in the various counties of the state in the good roads question is found in the work done in Davidson county in December. This county is one of the richest counties in the state and at the same time, one of the most backward. With the exception of Lexington township, where some attempt at road improvement has been made, there are no good roads in the county. In December the Davidson County Agricultural Association, an organization that has been in existence about three years and which has accomplished a great deal in the way of increasing crop yields, improving methods of farming, etc., undertook to carry the gospel of better farming and better roads to the country people. A party of farming experts and good roads advocates was formed and a tour of the county arranged. In this party were: Mr. J. L. Burgess, agronomist, North Carolina Department of Agriculture; Mr. E. S. Millsaps, district agent of Demonstration Work, U. S. Department of Agriculture; Mr. J. E. Meredith, county demonstration agent; Mr. H. B. Varner, President of the North Carolina Good Roads Association; Messrs. J. R. McCrary and Z. I. Walser, prominent lawyers of the county. These men spent ten days touring the county. Every township in the county, seventeen in all, was visited and nineteen local agricultural and good roads associations were organized. At every appointment the best farmers in the community turned out to hear the speakers and to help in the organization and these local associations are now holding regular monthly meetings, discussing problems of farming, good roads and other questions of interest.

Interest in the approaching session of the state legislature grows daily. It is practically certain that many of the reforms asked for by the Southern Appalachian Good Roads Association and the North Carolina Good Roads Association, will be enacted into law. Senators and representative-elect are taking a great deal of interest in road problems and promise real progressive road legislation. In Caldwell county Representative-elect Crisp called a mass meeting of his constituents at Lenoir, the county seat, to consider road legislation for the county. A great many progressive citizen attended the meeting and talked the road situation over with their representative. They decided to ask the legislature to call a special election to vote on a tax levy sufficient to start road improvement on a large scale and to establish a county chain gang. Later they will ask for a bond election.

* * *

Nebraska.

Various good roads organizations and allied interests of the state have drafted a bill which they will submit

at the coming session of the state legislature. The measure has been added to since the original draft was printed in the papers, the new bill providing that the state board of irrigation shall be abolished and the state highway commission, consisting of the same state officials, the governor, attorney general and land commissioner, shall take its place. All duties possessed by the present board are to be vested in the new body, if the bill becomes a law.

The bill in this regard says:

"All the powers and duties hitherto by law conferred upon the state board of irrigation, highways and drainage are hereby conferred upon the state highway commission, provided for in this act, and the said state board of irrigation, highways and drainage is authorized and required to turn over to said state highway commission within thirty days of the taking effect of this act all state property of whatsoever kind belonging to and in the custody of the state board of irrigation, highways and drainage. It shall be the duty of the state highway commission to carry out and enforce all of the heretofore existing statutes relating to the pow-

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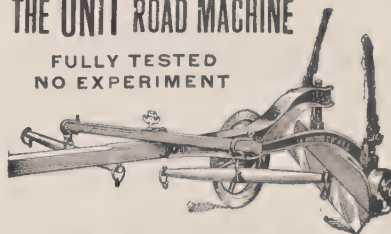
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ers and duties of said state board of irrigation, highways and drainage and to so co-ordinate and combine the duties hitherto devolved upon said state board of irrigation, highways and drainage with the duties prescribed in this act for the state highway commission as to secure the greatest efficiency and economy for the state."

* * *

New Mexico.

Col. R. E. Twitchell, president of the State Good Roads Association of New Mexico, is carrying on a campaign of education in his state that has aroused widespread interest. He arranged a lecture tour that covered every town of importance in the state and secured Mr. Maurice Owen Eldrige, one of the leading good roads experts in the service of the United States Office of Public Roads, to do the principal speechmaking.

* * *

Oregon.

A spirit of optimism, founded on a belief that all the preliminary skirmishes in the battle for better highways in Oregon have been fought, seems to possess the leaders of the good roads movement in Portland, Oregon. Undaunted by the fact that their hopes have been repeatedly crushed, they maintain that a certain amount of vicissitude must ever attend the early struggles for any good cause, and assert that a unity of thought has resulted from the clash of conflicting opinions which will be manifest in a unity of action before the next legislature.

This hopeful attitude is shared by Governor West, who, in a recent letter to W. J. Clemens, president of the Portland Automobile Club and a member of the last Legislature, said: "I am hopeful of something desirable being saved out of the wreckage." In the same letter the Governor expresses a hope that he may have the opportunity of a conference with Mr. Clemens on the subject of good road legislation before the next Legislature convenes on January 13.

To appoint a commission composed of good road workers representative of every section and interest of the state, with a view to drafting a good roads bill that will be satisfactory to all concerned, is the plan that Mr. Clemens will submit to the Governor. He would have this commission obtain expressions from farmers, business men, automobile owners and non-automobile owners, from county judges and commissioners, in fact, from the angle of every interest in Oregon, and weld these expressions into a harmonious bill which will be satisfactory to all concerned.

* * *

Texas.

With the object of aiding the Winnipeg-to-Galveston highway, the gulf division of the meridian road project has been organized at Houston, Texas, in the Chamber of Commerce rooms. W. A. Johnson, of Galveston, president; George W. Hawkins, of Houston, first vice-president; L. H. Hewitt, of Bryan, secretary. The officers and the members of the executive committee will meet later to further perfect the organization and take such steps as they deem necessary to promote the project in the gulf division.

* * *

Virginia.

The good roads enthusiasts of the Old Dominion are starting right with their 1913 campaign for better roads by seeking to interest the boys and girls of the public

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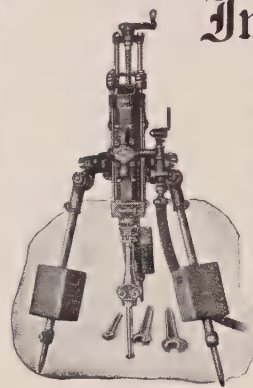
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full sized blade, 7 ft 3 in. long, 16 in. wide, removable cutting edge, equipped with flanged wheels to avoid skidding and side draft, arched beam, no clogging. Sand proof hubs. Weight 850 lbs. Get our Catalogue.

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schools of the state in better roads. Virginia good roads boosters are starting a campaign to arouse the people to a realization of the vital necessity of good roads if they are ever to have good schools and the Richmond News-Leader says that a vigorous campaign in the interest of better highways will be promulgated throughout Virginia during the month of January. The work in the interest of good roads in the state is being promoted by the Co-Operative Education Association and the officers have asked the assistance of the county superintendents in the enterprise.

Efforts will be made to hold meetings in the various schools for the purpose of discussing road improvements and a handsome prize will be given the child who writes the best essay on the subject of good roads. The condition for competition for the prize is that the composition is to be read at a public meeting of the school during the month of January. These essays are to be sent to the Co-Operative Education Association and a committee will decide which is the best.

Leading citizens and the best local speakers will take part in the meetings and excellent results are expected.

* * *

Washington.

Upholding good roads as one of the best means of advertising and developing the state, favoring an appropriation of \$500,000 for the Panama Pacific exposition in San Francisco in 1915 and the construction of the Inland Empire Highway from Spokane to North Yakima via Walla Walla and Pasco, members of the South-eastern Washington Development league held an enthusiastic meeting at the Commercial Club rooms at Walla Walla, Washington, last month.

Resolutions adopted strongly favored a system of state highways, tapping the agricultural and horticultural districts of the state and opposing at this time the taxing of the developed districts to build state highways through the scenic regions. The present system of state highways in the state is inadequate and does not serve the fruit and farm districts in a manner best to aid development, is stated in the resolutions.

The contract for building ninety miles of good roads in Precinct No. 1 of Gonzales county, Texas, has been let by the county commissioners. The larger part of the roadbuilding machinery necessary for the work has arrived and all will be in operation in a few weeks. About \$150,000 will be spent in this precinct and the work may be carried to other precincts in the county before it is stopped.

The Sanford, Fla., Herald says that the new county of Harney will start in business with twenty-five miles of brick roads. They do not cost the taxpayers outside of the Sanford district one cent. The new county will have all the tax money spent for improvements. The Sanford section is known by her works.

The harness-makers' and blacksmiths' unions are fully justified in vigorously opposing all road improvements.

A railroad without section gangs is as sensible a proposition as an expensive road without patrolmen to keep it in repair.

There is consolation in the fact that the good roads fever is epidemic.

Save the Trees

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Every good roads advocate ought to be interested in the preservation of trees. Therefore you should write for our interesting book on trees and how to save them. If you own trees or have the care of trees, we will send you the book free by mail, and will arrange for an expert examination of the trees, free of charge. The book explains how the

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GOOD ROADS NOTES IN BRIEF

It is reported that a company is being organized to construct a cement roadway from Gainesville, Ga., to Dahlgene, Ga., a distance of 32 miles.

Baltimore, Maryland, recently awarded a contract at \$35,686.94 for granite block pavement.

Lyons, Georgia, has voted bonds for street improvement to the amount of \$12,000.

Covington county, Mississippi, has awarded a contract for the construction of 23 miles of top-soil and sand-clay roads at a cost of \$25,000.

At a cost of \$14,668 the city of Joplin, Missouri, is paving Sergeant avenue with liquid bituminous paving.

Adams county, Mississippi, is preparing to improve 60 miles of road at a cost of \$160,000.

Cheatham county, Tennessee, has voted bonds to the amount of \$100,000 for road improvements.

Bell county, Kentucky, will vote on the 4th of next March on a bond issue of \$500,000 for the building of macadam roads.

Dallas, Texas, has awarded contracts for the paving of two streets at a total cost of over \$30,000.

Denison, Texas, is preparing to spend about \$15,000 on asphalt macadam.

The city of El Paso, Texas, is spending \$40,000 laying pavements in the Government Hill section.

Norfolk, Virginia, has awarded contracts for 55,000 square yards of asphalt paving and 18,000 square yards of curbing.

Lafayette county, Mississippi, has awarded a contract at \$100,000 for the construction of 25 miles of road.

The city council of El Paso, Texas, is preparing to spend \$20,000 in paving in the downtown district.

San Angelo, Texas, will construct about 40,000 square yards of paving in the residence district.

The city of Spartanburg, South Carolina, is preparing to spend \$90,000 on her streets and sidewalks.

District No. 1, of Montgomery county, Texas, has voted good roads bonds to the amount of \$250,000.

The city of Plainview, Texas, has voted \$12,000 worth of bonds for street improvement.

Atacosa county, Texas, will vote the twenty-fifth of this month on a proposed road bond issue of \$25,000.

The Mobile, Alabama, Board of Revenue and Road Commissioners have let a contract at \$17,615 for the surfacing of St. Stephens' road.

At a contract price of \$35,229 the city of Paris, Texas, is preparing to pave certain streets with rock asphalt.

The Maryland State Roads Commission has appropriated \$25,000 for road work near Belair.

The De Soto parish, Louisiana, Police Jury is preparing for the expenditure on the roads of the parish of a recent bond issue of \$28,000.

The fact that your county cannot afford to build a ten-thousand-dollar-a-mile road is no reason for despising the sand-clay at one thousand dollars; yet some people prefer no bread at all to half a loaf.

Few farmers realize that when the bottom drops out of their roads it leaves a hole in their pocket-books.



BRIDGES & CULVERTS

At a cost of \$9,216, the Pike county, Alabama, commissioners are building a steel bridge with concrete floor over Conecuh river.

The Board of Public Works of Tuscaloosa, Alabama, is building four reinforced concrete bridges at a cost of over \$5,000.

El Paso county, Texas, is preparing to build two bridges at a cost of \$7,000.

Southampton county, Virginia, is preparing to build eleven steel bridges.

Columbia and Hamilton counties, Florida, will build together a bridge at White Springs, across the Suwanee river.

Colquitt county, Georgia, is building a bridge over the Ocklockness river at a cost of \$3,000.

The Navy Department will spend \$50,000 building a bridge over Dorsey creek at the Naval Academy at Annapolis, Maryland.

The city of Baltimore, Maryland, has awarded a contract at \$16,150 to construct a masonry arch and retaining walls at the Wymans Park bridge.



An Object Lesson Sand Clay Road, Built at Aiken, S. C., at a Cost of \$400 Per Mile. The Road is Completed Except For Final Dragging and Shaping

Oklahoma City, Oklahoma, will construct a steel bridge with concrete abutments over Lightning Creek.

At an estimated cost of \$10,000 Radford and Dublin districts of Pulaski county, Virginia, will build a bridge over New river.

The District Commissioners of the District of Columbia will petition congress for an appropriation of \$60,000 for the construction of an additional draw in the Pennsylvania avenue bridge across the Anacostia.

The city of Tarpon Springs and the county of Pinellas, Florida, will together construct a bridge across Whitcomb bayou.

Mercer county, Kentucky, will construct a steel bridge across Salt river.

Nueces county, Texas, is considering the construction of a bridge across Nueces Bay to connect Nueces and San Patricio counties.

The Red River Bridge Co., has been organized at Denison, Texas, to build a bridge over the Red River.

Kanawha county, West Virginia, will build a bridge across Elk river near Jarrett's Ford.

MILESTONES.

A rotten road usually runs through a community to correspond.

* * *

More fortunes have been lost in mud-holes on the road than were sunk in the insatiable sea.

* * *

Opportunity sticks to the smooth highway—you seldom find her bumping over rutty roads.

* * *

Napoleon, the Corsican, gave France her pride, but MacAdam, the Scotchman, gave her her wealth.

* * *

You can no more have a great farming section without good roads than you can have a healthy man without a good nervous system.

* * *

As two pennies held close to the eyes will blot out the sun, so a small road tax to a stingy man blots out all the good he might receive.

* * *

The road supervisor who dumps a load of broken stone in a mud-hole by way of mending it may get to Heaven, but he lessens the chance of every driver who has to pass that way.

* * *

In 1862, during the greatest struggle of its existence, the United States gave \$50,000,000 to a railroad, but after fifty years of peace it has but \$500,000 for all its highways.



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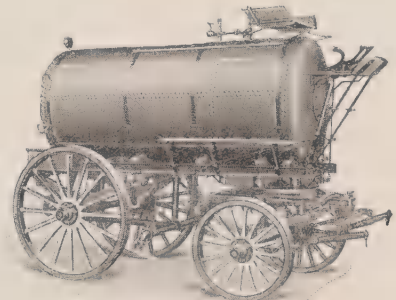
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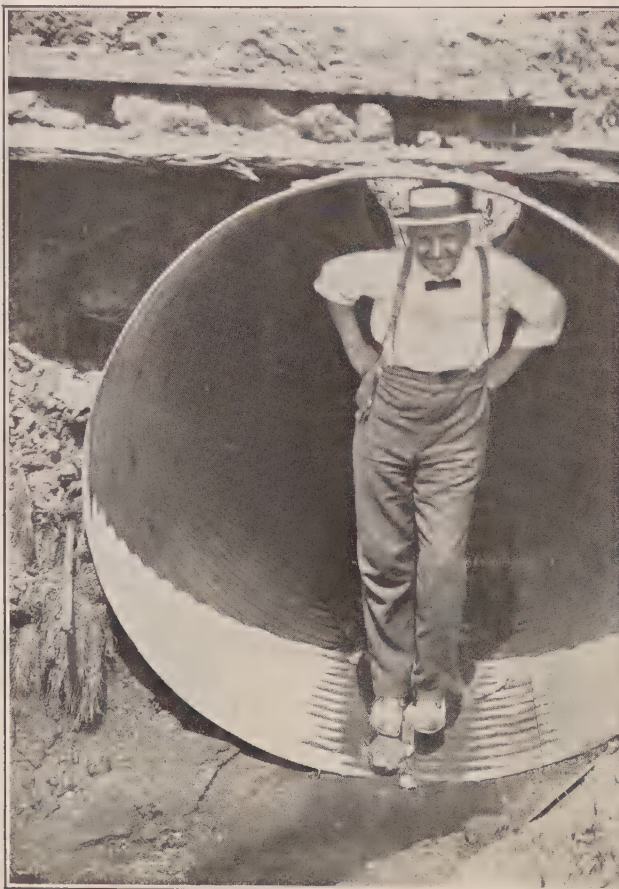
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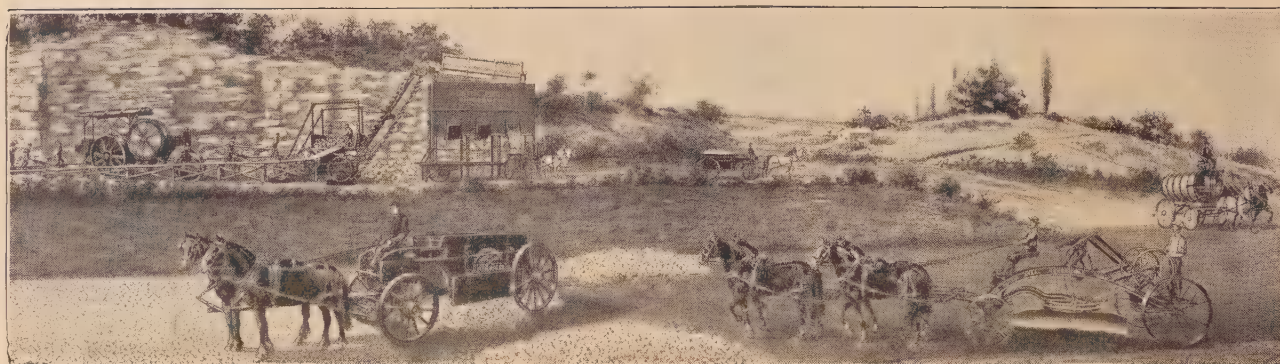
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SOUTHERN GOOD ROADS

Vol. VII. No. 2.

Lexington, N. C., February, 1913

10c. a Copy



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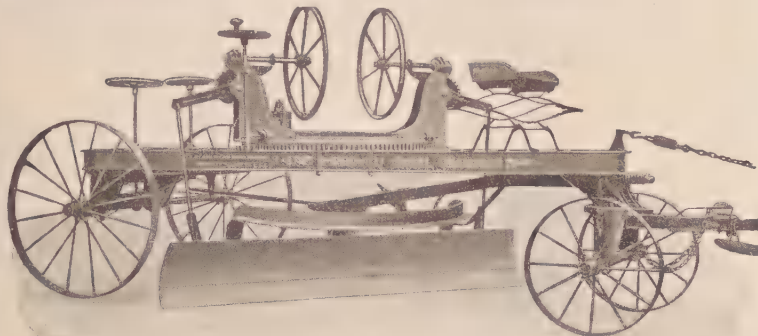
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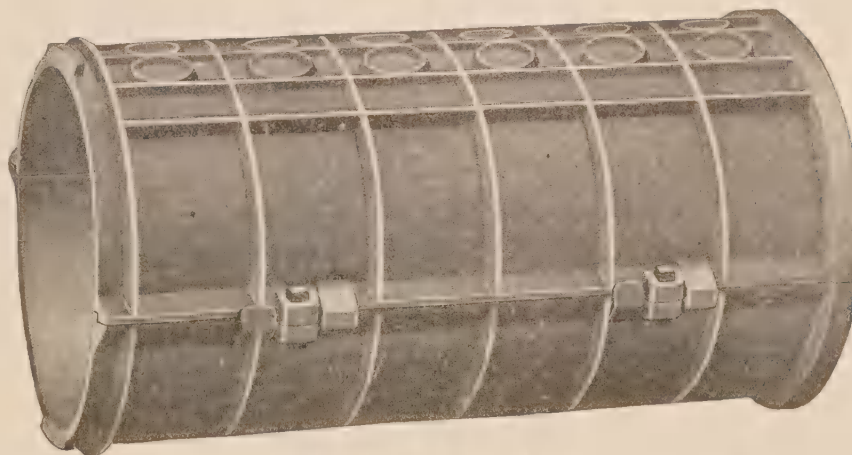
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Good Roads and the High Cost of Living

By HON. W. W. FINLEY

President Southern Railway Company

A SUBJECT that is being almost universally discussed in other lands as well as in the United States is the high cost of living. In the periodical literature of the day it occupies a prominent place and many are the influences to which it is attributed. Whatever may be other contributory causes, I believe that statistics establish the fact that population and demand for the materials for food and clothing are increasing at a greater rate than their production. Most of these materials are produced on the farm and we must rely upon the farmers to bring their production up to the prevailing demand. In my opinion, the two factors that will be most potent in bringing about this result will be increased average yields per acre of farm crops and the placing of increased areas of land under more intensive cultivation.

As to the first of these I shall say nothing more than that modern scientific farming is demonstrating the practicability of greatly increasing soil productivity and that, in the southeastern states at least, substantial progress is being made in the practical application of the methods necessary to bring about increased average yields per acre and for the larger production of meats and dairy products. For the extension of these improved methods of farming over larger areas we must rely very largely upon the improvement of the country highways. Some idea of what may be accomplished in this direction is given by the figures of the last census which show that, in the nine states south of the Ohio and Potomac rivers and east of the Mississippi river which are traversed by the Southern Railway System and which have a superficial area of 264,058,880 acres, only 82,831,384 acres were classed as improved farm lands.

Every one who has had any experience in the matter knows that among the first things a prospective farm settler wants to know about is the distance from the railway station and the character of the road from the station to the farm that is being offered to him. Some branches of agriculture are much more dependent upon good country highways than others. The man who is engaged exclusively in the raising of cattle which can be driven for long distances to a shipping station, as is still done to some extent on Western ranches, is, in a measure, independent of the condition

of the roads. The grower of corn and any other crops which can be stored for a time without deterioration, can manage to get along even though his road to a shipping station may be impassable at times. He is greatly hampered, however, by the necessity of doing his hauling in good weather regardless of market conditions and of whether or not his farm operations may be seriously retarded by the absence of himself and his team. For the dairy farmer, the fruit and vegetable grower, and for the producer of perishable commodities of all kinds, ability to get his products to market at all seasons of the year and in all kinds of weather is absolutely indispensable to success. For all kinds of general farming, therefore, a good country highway is essential to the most profitable operation of the farm and to any considerable development of agriculture at a distance from a market town or shipping station.

This whole subject of the effect of good roads upon farm production and the cost of living is one which concerns all classes of people. Primarily and most directly the benefits of good country highways go to the farmer. Less directly the benefits go to merchants and manufacturers by giving them wider markets for their goods and decreasing the cost of distribution.

From the viewpoint of the railway, to the extent to which the good road extends the area of profitable agriculture, leads to increased production, and adds to the prosperity of the farmer, it enlarges the volume of traffic. It is for this sound business reason that many of the railway managers of the United States are manifesting a practical and helpful interest in the good roads movement.

Increasing farm production by getting more people onto the land and by bringing enlarged areas under more intensive cultivation is largely a matter of transportation. If the farm is to be profitable, its products must be sent to market. Wherever the final market may be, the first movement is over the country highway, which thus becomes a part of the general transportation system including waterways and railways. In some localities railway construction may be necessary to the provision of adequate facilities for carrying farm products to market. But in the many localities adjacent to existing railways which are capa

ble of higher agricultural development, the necessity is for the improvement of the country roads.

May it not be a fact that the transportation needs of many localities that seem to be waiting on railway construction would be met more satisfactorily and more comprehensively by a system of goods connecting them with existing railways? The railway should be located with reference to the main traffic channels. It can no more take the place of the wagon road for the collection and distribution of traffic in a rural community than the wagon road can replace it as a main highway of commerce. Considered as parts of a general transportation system the railway and the wagon road supplement each other, and I believe that this relation should be recognized in the formulation of plans for road improvement.

Local support for the good roads movement should be kept alive. Whatever policy may ultimately be adopted by the federal government, I believe it would be a serious mistake for any community to adopt a do-nothing policy in the hope that, at some time in the future, the improvement of its roads may be undertaken by the federal government alone. The Office of Public Roads in the United States Department of Agriculture is doing valuable service in the investigation of road-building methods, in the dissemination of educational literature, and in giving expert advice. I believe that, whether or not the policy of federal aid now to be tried experimentally, shall be definitely adopted, the activities of this office might properly be

tended so as to enable it to enlarge the work of sending its engineers over the country to give practical advice and instruction. The state also has its proper field of activity, and, under some circumstances, it may be proper for the states to undertake the construction of certain more important roads. As a general rule, however, the greater part of the work can best be carried on in accordance with county plans, carried out by county organizations.

I believe that the most effective system of improvement is that which has in contemplation benefitting the largest number of road users. Each county should adopt a definite plan to meet its peculiar needs. In every county the volume of traffic moving over certain roads is much heavier than on others. In formulating a county plan, therefore, the principal of benefitting the largest number of road users and the wise conservation of road-building funds should lead to attention being given primarily and principally to those roads over which the largest volume of traffic is now moving or those the improvement of which may be expected to develop the largest volume of traffic. I feel qualified to speak of the importance of this for the reason that it is similar to the policy that must be adopted by a railway company through devoting its available resources largely to improving those parts of its lines where traffic is heaviest and where congestions are most liable to occur. This policy facilitates the movement of traffic over an entire railway system. In the same way, the most important roads in a coun-



This Picture Shows a Fine Stretch of Gravel Road in Shelby County, Tennessee, Near Memphis, and a Good Bridge in the Background

t. and the ones on which traffic is heaviest are those radiating from a market town or shipping station, and the improvement of these roads benefits, not only the farmers immediately adjacent to them, but also those in more remote parts of the county who have the advantage of good roads for at least part of their haul.

Ranking in importance with the determination of the order in which the roads of a county are to be improved is the formulation of a definite plan for carrying on the work. As a means of conserving the resources of the county and securing the best results in proportion to the outlay of money and energy, I be-

lieve it is important that any plan adopted should provide for competent supervision. Under the system that has most generally prevailed in the United States road supervisors have generally been men, without special training, most of whose time has been devoted to farming or other occupations, and it is no reflection upon them to say that, in many instances, they have been more or less incompetent. It could not be expected that it would be otherwise. The few days in each year that the supervisors could give to the work were not sufficient to enable them to learn much by experience, and, prior to the inauguration of the general dissemination of literature on the subject, there was no way for a man to learn much of practical value about road building without taking a course as a civil

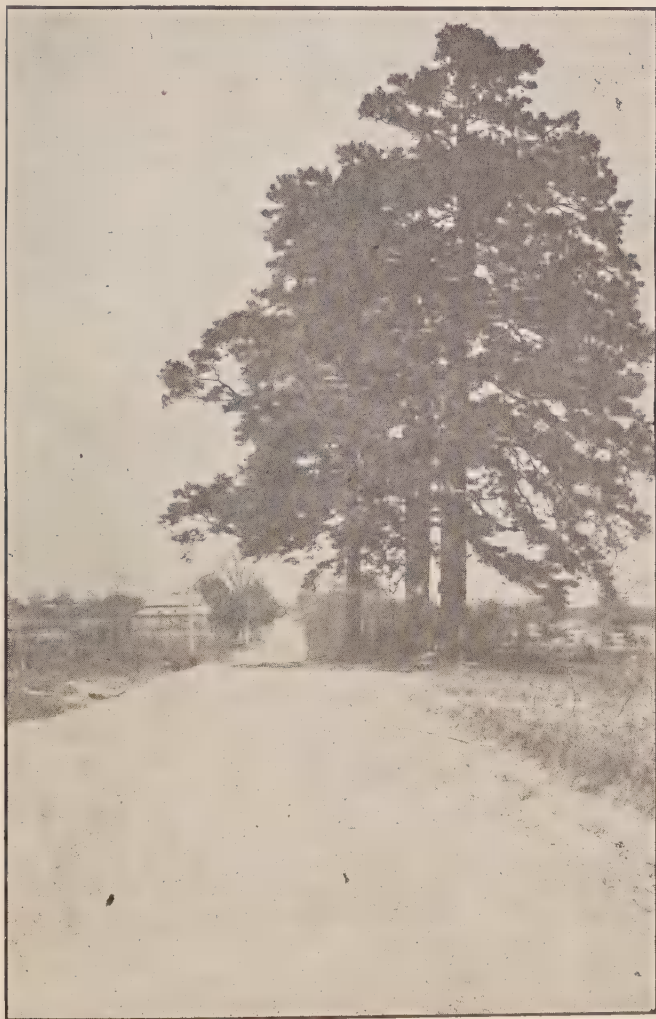
engineer. The result has been that much of the work done under the supervisor system has been of little value, and I believe I am safe in saying that, if all of the work that has been done on the country highways of the United States had been intelligently directed, those roads would now be in a high state of improvement.

For these reasons I believe it will be profitable for each county to place all of its road improvement and maintenance work under the supervision of a competent highway engineer. If a macadam or other type of highly-improved highway is to be built, the services of an engineer are necessary, but I believe that he may be of fully as much value in directing and supervising the improvement and maintenance of those roads in the county which are not immediately to be highly improved. Outlying roads not embraced in projects for immediate improvement to a high standard should not be wholly neglected. Under competent supervision they may often be maintained fairly well at relatively small cost. Especially is this true if conditions are favorable to the use of the split log drag.

Results obtained in the past under the old system of working out road taxes have not generally been such as to commend it and it has been subjected to severe criticism at the hands of some advocates of good roads. It is a system, however, which will probably be continued for longer or shorter periods in many localities and I believe that, so long as it is retained, we should endeavor to make the most of it. As I have indicated, I believe that poor results obtained under this system have been largely due to lack of proper supervision. Here is a field in which the county road engineer could be highly useful. He could give effective direction to all of the road work done in the county and see that the labor and materials available were so used as to accomplish the best results. With a few years work of this kind material improvement could doubtless be made on the outlying part of the road system beyond the zone of highly-improved highways. Such a system of handling the outlying roads would be particularly valuable in increasing the area within which the country road would be effective in agricultural development.

Even the most effective work of this kind under the most competent supervision, however, will have to be supplemented by cash outlay if high-type roads are to be built. The question of how the necessary funds shall be provided is one of great importance. This may be done by raising by direct taxation the amount to be expended from year to year or by issuing bonds and limiting taxation to the amount necessary to provide funds for current road maintenance, pay annual interest charges, and provide a proper sinking fund. I believe the latter system will generally be preferable. It enables the county to carry out larger projects without delay and reduces the immediate tax burden and carries some of it forward until advanced land values and increased prosperity, consequent upon road improvements, increase ability to pay. As future generations will enjoy the benefit of the work done, it is not improper that they should be called upon to pay part of the cost.

The citizens of Montgomery county, Texas, recently voted bonds to the amount of \$250,000 to be used in constructing good roads in this county. Work will begin at the earliest possible date.



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lieve it is important that any plan adopted should provide for competent supervision. Under the system that has most generally prevailed in the United States road supervisors have generally been men, without special training, most of whose time has been devoted to farming or other occupations, and it is no reflection upon them to say that, in many instances, they have been more or less incompetent. It could not be expected that it would be otherwise. The few days in each year that the supervisors could give to the work were not sufficient to enable them to learn much by experience, and, prior to the inauguration of the general dissemination of literature on the subject, there was no way for a man to learn much of practical value about road building without taking a course as a civil

Experimental Surfaces and Special Surface Treatment Under Special Conditions

By WM. H. CONNELL

Chief of Bureau of Highways, Department of Public Works, Philadelphia, Pa.

FOR CONVENIENCE this paper will be divided into two sections, namely Section 1—"Experimental Surfaces" and Section 2, "Special Surface Treatments under Special Conditions."

SECTION 1—EXPERIMENTAL SURFACES.

I do not think it an extravagant statement to say that there is no subject more widely discussed today than road surfaces. The constantly increasing use of the automobile for business purposes, as well as for pleasure, has brought the public to a realization of the benefits to be derived from, and the economic value of a good road surface. It therefore devolves upon the engineer to provide a good road surface, and this cannot be accomplished without carrying on experiments along scientific lines. Many such experiments have been conducted throughout the country, from which very valuable data has been collected which has wielded a mighty influence in directing the policy of constructing road surfaces. You will often hear engineers and material manufacturers say, "Oh, we don't want

close watch over the experiments with road surfaces carried on throughout the country. Of course, there probably has been some repetition, but this is unavoidable under present conditions, and is not only the case with highway engineering, but in all other branches of the engineering profession, and it is primarily due to the lack of co-operation of branches of the federal, state and municipal governments having charge of the public works. If an association was formed embracing the public works departments for the purpose of standardizing specifications, it would tend to encourage conducting experiments along scientific lines, and the data collected would be a public record and available throughout the whole country. This would do away with the repetition in any one locality of the mistakes made in another. Such an organization would result in increased efficiency and enormous savings to the public works departments. Continuous and progressive change is unavoidable in specifications of materials, owing to the development of the manufacturers' arts and advancement of science, and it is necessary that we should follow these developments if we wish to keep abreast of the times with our work, and the only way this can be accomplished is through co-operation and an organization along the lines of the one mentioned, is suggested as a means of bringing about the desired result.

No damage has been done, however, as far as the repetition of experiments of road surfaces is concerned, as modern highway engineering is in its infancy, and any experiments, even though duplicated in some other part of the country, have been an education to the engineer and the public in the respective sections in which they have been conducted, for, in the absence of such an organization as suggested, one section of the country is not familiar with what is going on in other localities.

The value of experimental surfaces depends entirely upon the manner in which the experiments are conducted; complete detailed cost data should be kept and published, as cost data is of no value unless given in detail in order that comparisons may be made with other localities where rate of wages, labor hours and cost of materials may widely differ. Specifications comprising the mineral aggregate, analysis of materials used and their origin, together with a traffic census, should also be published and an account of the conditions of different surfaces should be written up each year. This data should be given the widest publication as experimental surfaces are of little value if the data is only available at the locality where the experiments are conducted.

We are all striving to accomplish one purpose, to construct good roads, and to bring about this purpose, the engineers throughout the country should co-operate with one another, and there is no better way to do this than by constructing experimental surfaces and



Fine Sample of Tarviated Macadam Road Near Greenville, S. C.

any more experiments; we have had enough of experiments." When I hear such remarks, and I have often heard them, I think of the time honored expression that will live forever—"Where ignorance is bliss, it is folly to be wise." And invariably, if you look up the standing of these men, you will find that they have not yet seen the light and do not appreciate the vast problem the Highway Engineer has to contend with. They have been accustomed to look upon highway engineering as of minor consideration and therefore do not realize the vast importance attached to and the benefits derived from conducting experiments. All of these men are, however, unconsciously guided by these experiments and are benefitting from the lessons learned by the men who are conducting them and have kept



New Macadam Street at Lexington, North Carolina, Connecting the Winston-Salem Southbound Railway Company's Station With Fifth Avenue. The Street Was Built by T. S. Eanes, of Lexington, and Paid For by the Railroad

giving wide spread publication to the data collected. It is a notable fact, that in the sections of the country where experiments, have been carried on, you will invariably find the best roads, which, in itself is the best evidence of the value of experiments.

Experimental road surfaces are a great economy as a guide in constructing long sections of roads and have prevented countless failures. There is no longer any excuse for a complete failure in road surfaces as there is sufficient data available at the present day from experiments carried on in the past few years, to enable us to select a more or less satisfactory road surface for every section of the country. There is no excuse for trying some new and questionable road surface on a stretch of roadway of any great length. Anything of this kind, if it has sufficient merit, should be laid on a short stretch of roadway as an experiment. There is unquestionably a large sum of money wasted every year trying out new surfaces or methods of surfacing on roadways, when the same should be tested on a short experimental stretch. The experiments conducted throughout the country in road surfaces the last few years have resulted in establishing more or less standard surfaces and methods of surfacing adapted to present traffic conditions. But this does not mean that our experiments should cease, as these so-called standards are simply an improvement on the old water bound macadam, and therefore a step in the right direction, and in order to determine the relative value of these so-called present day standards, they should be compared in a service test under different traffic

and climatic conditions, in order that further improvements and refinements may be made, as we are still far from the ideal and when I refer to present day standards, I wish to distinctly emphasize the fact that the so-called standards of today will not be the standards of tomorrow, and it will be many years before the various road surfaces even approach what might be called standards in the sense in which we refer to standard city pavements.

Unfortunately, we are being hampered very much by questionable patents, particularly in surface constructions by the mixing methods and a review of the decisions of the courts in various parts of the country, show a deplorable lack of an understanding as to what does and what does not constitute a valid patent in the nature of a pavement. This has resulted in confusion and almost a state of chaos, with regard to road surfaces constructed by the mixing method. In Timbuctoo you can lay any kind of a pavement or road surface by the mixing method, but the courts have decreed in Kamschasta that almost any kind of a road surface constructed by the mixing method infringes on somebody's patent. This state of affairs can, however, be largely attributed to the lack of familiarity with pavements by laymen and professions other than the engineering profession. At the present rate of progress, however, we will all be more or less familiar with road surfaces before very long, and will be better able to judge what should be and what should not be patentable, in the nature of a pavement. When we arrive at this period we will be so enlightened on

the subject that there will be no question as to our right to construct the kind of pavement we think best suited in front of the court house without infringing on some body's patent.

Experimental surfaces which come under the head of the present day so-called standard, may be divided into four classes, namely:

Class "D" Water bound macadam or gravel road surfaces, over which should be applied some kind of a bituminous surface treatment, dependent upon the gradient, traffic, climatic and local conditions and the characteristics of the materials used in construction. This type of roadway is suitable for park drives and suburban residential streets where the traffic is light.

Class "C" Bituminous surfaces built by the penetration method. This type of road surface is desirable

ways. It is also suitable for suburban and city streets with medium city traffic.

All of the above types of road surfaces are constantly being improved upon, both with respect to the bituminous binders used and the mineral aggregate, and it is to be hoped that the construction of experimental surfaces conducted along scientific lines will be continued in order that we may be enabled to more closely approach the ideal road surfaces.

SECTION 2—SPECIAL SURFACE TREATMENT UNDER SPECIAL CONDITIONS.

Special surface treatment under special conditions is, generally speaking, rather a broad subject, as in order to get the best results it is essential that a special study be made of each roadway under consideration for a bituminous surface application.

The primary considerations for macadam or gravel roadways are: 1st, the gradient, 2nd, the amount and character of the traffic, 3rd, the social or local conditions, 4th, the condition of the surface of the roadway 5th, the character of constructing and quality of stone used in the construction, 6th, the economic point of view.

With a medium or comparatively heavy traffic, consisting of light driving and automobiles, what is generally known as a bituminous pad is both desirable and economical if the character of the roadway is not to be changed for a couple of years. The bituminous material may consist of an asphaltic material or a tar product applied at a temperature of about 220 degrees F. or a cut back asphalt applied cold. To receive such an application the road should be in good condition and the surface thoroughly swept with horse drawn and hand brooms until all fine material has been removed from the surface and the surfaces of the stone exposed. A quarter of a gallon to the square yard of bituminous material should then be applied under pressure, over which a light layer of stone chips, free from dust, torpedo sand or fine wash gravel should be spread. The roadway should then be rolled with a light roller or opened to traffic until thoroughly compacted and the above operation repeated. This should last from two to three years, depending upon the amount of traffic.

It will be observed that this treatment is proposed for a roadway having a medium or comparatively heavy amount of light driving and automobile traffic. The amount of traffic is particularly emphasized, as the mistake has often been made of applying such a bituminous application as described on roadways and park drives where the automobile traffic is too heavy for such treatment. An illustration of this is on Riverside Drive and in Central Park, New York City. The automobile traffic is so great on these roads that from an economic point of view, nothing short of a good bituminous pavement, such for example, as is laid on the park drives in Chicago, would be satisfactory. Such a surface treatment as described is only justified on a roadway of this character as a temporary expedient.

On a roadway consisting of heavy horse drawn traffic, the only solution seems to be an application of about 2-10 gallon to the square yard of asphaltic road oil of about 20 Beaume gravity or an application of oil emulsion—asphaltic road oil is preferable. The road should be swept with a horse drawn broom first and the application repeated as often as is necessary to lay the dust. It is advisable to apply the road oil in light ap-



This is a Gravel Road Surfaced With Liquid Asphalt. The Road is Near Anacostia, Maryland, and the Work Done One Year Before This Picture Was Taken

in localities where a more durable pavement than a Class "D" pavement is required, and where it is not practicable to lay a pavement by the mixing method.

Class "B" Bituminous surfaces built by the mixing method, consisting of a mineral aggregate not proportioned with a view to producing a dense mixture. In its present stage of development I believe a concrete surface with a bituminous top, also belongs to this class. These pavements are suitable for park drives, suburban residential streets and country roads where the traffic and local conditions justify the additional expenditure over a Class "D" surface.

Class "A" Bituminous surface built by the mixing method, consisting of a dense mineral aggregate. This type of pavement is desirable on park drives and country roads with heavy traffic for such types of road-

plications with the object in view of having it disappear from the road before the winter sets in, as too much oil acts as a lubricant to the road, particularly during the winter thaws, which result in a mushy surface and does considerable damage to the road.

On suburban residential streets where the traffic is light and consists principally of delivery wagons and automobiles and the character of the road material consists of Rockland Lake, Birdsboro trap, or the equivalent, a very desirable and economical surface can be had by sweeping the roadway with horse drawn and hand brooms until the fine material is removed and the surface of the stone exposed. Then apply about 1-2 gallon to the square yard of a tar product of such consistency that it can be applied cold and will set up



This is a Section of Gravel Highway Near Colfax, Louisiana. The Gravel Road Properly Constructed Has Few Superiors

quickly; over this application a layer of hard stone chips free from dust, or a fine wash gravel, sometimes called torpedo sand, should be spread; the fine wash gravel or torpedo sand is preferable. The writer has had considerable success in this class of work using a refined tar product known as Tarvia B or a U. G. I. product. This method requires one treatment a season of about one half gallon to the square yard for the first treatment, and subsequent applications require about one third gallon to the square yard. This method of treatment gives a hard smooth surface to the roadway, is not mussy after being covered and consequently, is not carried in to the houses by the children, and on the whole, is, in the writer's opinion, the most desirable treatment with the materials at hand at the present day, for suburban residential streets coming under the head of those above described.

On country roads where the traffic consists principally of delivery wagons and occasional automobiles, the most economical form of treatment is occasional applications as required of about two tenths of a gallon to the square yard of asphaltic road oil of about 20 Beaume gravity applied under pressure, after sweeping the road with horse drawn brooms. There is an unlimited opportunity for special surface treatment under special conditions, in connection with a number of our so-called first class pavements, such as asphalt, brick, asphalt block, etc. There has been a great deal of attention devoted to special surface treatment on concrete pavements throughout the country, but very little attention has been devoted to surface treatments on asphalt brick, asphalt block, etc.

Some very interesting experiments in work of this character however, have been conducted in St. Louis, under the direction of Mr. J. C. Travella, Commissioner of streets. If an asphalt pavement is old and has, apparently, lost some of its life, a number of years can be added to the life of the pavement by applying a bituminous surface application, which will act as a seal coat and keep the moisture out of the pavement. This method of treatment can also be used to advantage on asphalt blocks which are showing signs of disintegration and require rejuvenating.

In St. Louis, old brick streets have been transformed into a fine smooth pavement through a bituminous surface application; each case, of course, requires a special study, in order that the form of treatment and material used may be best adapted to bring about the desired result. No general rule can be followed with regard to surface applications, and it is just as absurd to attempt to treat roads and pavements without making a special study of each case, as it would be for a doctor to apply the same treatment to several patients suffering from the same illness. The physician finds it necessary to look into each individual case, and in all probability, would not treat two patients alike. He would be guided in his treatment, of course, by the generally accepted principles governing the treatment for the particular disease or illness, in the same manner that an engineer should be guided with reference to the roadway or pavement, but the treatment of each patient would be the result of a special study, and so should the treatment of each roadway or pavement be the result of special study by the engineer, as in no other way can the best results be obtained.

The observations and statements embodied in this paper are more or less general, and are simply intended to emphasize the importance of striving for the ideal road surfaces and surface applications, which can only be accomplished through the data obtained from Experimental Surfaces and a study of Special Surface Applications under Special Conditions.

The foregoing suggestions herein contained regarding road surfaces and surface applications, are of course, based upon the conditions of the present day and the material used, and will therefore, be subject to modifications in the course of time.

Records show that there are now more than 700 automobiles in Williamson county, Texas or about one car to every 60 people. Farmers are the principal buyers, on account of the great improvements in the roads. It is estimated that something like 400 or 500 cars will be sold this year.

A Sampittic Road at Sharptown, Maryland

By MAJOR W. W. CROSBY

Former State Highway Engineer of Maryland

Rather late in the fall of 1911, the writer (then Chief Engineer to the State Roads Commission of Maryland) received authority from this commission to proceed with the improvement of a sandy stretch of road just inside the corporate limits of the village of Sharptown. The state was constructing a macadam road up to the village limits but the macadam was planned to stop at that line. From this point, in to the main street of the village, which street had a surfacing of shells and was in fair condition, the road was merely a

work begun (October 23rd, 1911) and carried on as follows:

The small amount of grading desirable was done—no culverts being necessary—and the road bed shaped to, approximately at least, the desired finished surface of the road, 24 feet wide with a crown of six inches. The grading was done by drag scoops and the shaping by a road machine or scraper followed by laborers with shovels.

The roadway was then sprinkled with a pitch compound ("Trinidad A" from the Barber Asphalt Company) to a width of 18 feet and with a quantity equal



On the Outskirts of Sharptown, Md., Showing the Original Stretch of Sandy Road

bed of sand for the entire distance of two thousand feet. An ordinary buggy would cut into the sand for several inches and, in dry weather, a horse walking over it would sink in hoof deep. During a rain, the sand would become somewhat more firm, but this extra firmness disappeared almost simultaneously with the stopping of the rain. Analysis of this sand was as follows:

Passing a 200 mesh	3.7 per cent.
Passing a 100 mesh	4.1 per cent.
Passing a 80 mesh	7.3 per cent.
Passing a 50 mesh	28.0 per cent.
Passing a 40 mesh	35.9 per cent.
Passing a 30 mesh	81.8 per cent.
Passing a 20 mesh	94.3 per cent.
Passing a 10 mesh	99.6 per cent.
Remaining on a 10 mesh	0.4 per cent.

No stone nor clay was available locally. (The stone for the macadam road mentioned was being shipped by water more than 100 miles and when delivered at the wharf at Sharpton cost \$1.25 per ton.)

The macadam work referred to was being pushed to the utmost in order, if possible, to complete it before November 1st, and it was desired that the improvement of this 2000 feet be completed by the same time. The traffic to be expected over the road when finished was sure to be relatively light and infrequent for a number of years at least. A decision to try out the Sampittic Surfacing was therefore reached and the



MAJ. W. W. CROSBY

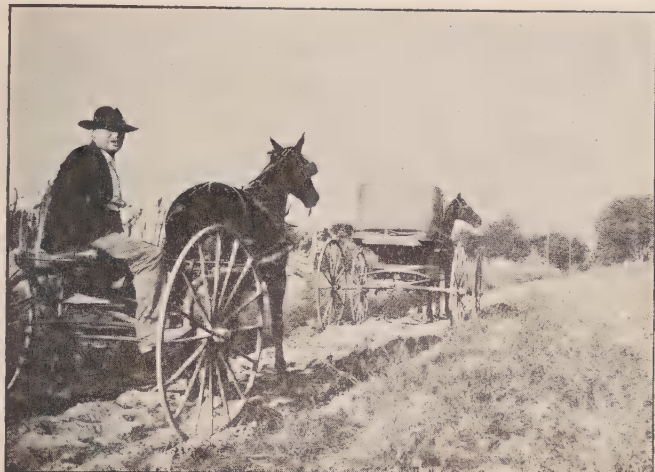
to one gallon per square yard. The pitch was applied cold by hand from sprinkling pots or from an ordinary horse drawn water sprinkling wagon and immediately thereafter the roadway thoroughly "cultivated" with a horse drawn "cultivator," such as is used in farm work, to a depth of six inches or thereabouts. After "cultivating," an old fashioned "spike harrow" (wooden frame, A shape, with spikes projecting from the lower side of the frame) was hauled over the roadway until all lumps were broken up and the surface appeared fine and uniform. About 100 tons of clean stone chips were then spread by hand over the roadway

and then another application of the pitch, of one-half gallon to the square yard made as before. The roadway was then again harrowed. A third application of the pitch was then made in an amount of $\frac{1}{4}$ gallon to the square yard and 125 tons of stone chips spread. The road was again harrowed thoroughly and then rolled with a two-ton, horse-drawn, farm roller.

The road was partly closed to traffic for a period of one week thereafter, but by no means entirely so. The barriers were then removed (the middle of November,

ly to a depth of perhaps two inches by the use of the harrow. An application of $\frac{3}{4}$ gallon per square yard of the pitch was then sprinkled on. Four hundred and sixteen tons of clean stone chips were then spread and harrowed in. A light coating of sand from the road sides was dusted over the road, the latter then thoroughly rolled with an eight ton steam roller and opened to traffic.

As stated, during the period between December 1st, 1911 and May 20th, 1912, the effects of traffic were per-



Another Picture of the Old Road Near Sharptown, Md., Which Was Transformed Into a Model Highway by the Sampittic Method

1911) and the road allowed to go without any attention until May 20th, 1912.

During this period, from the improvement by the macadamizing of the six or eight miles southerly from this piece of road and connecting with an excellent road between two important railway stations and from the perceptible improvement of the sandy stretch in question, the previous traffic over the road was greatly augmented. A heavy motor bus was put on



View of the Road After Pitch Had Been Applied and Partially Harrowed In

ceptible. An inspection report, dated May 22nd, 1912, contains the following:

"The surface generally presents an appearance something like 'Bitulithic' but more open and drier."

At the two ends of the section where traffic from intersecting roads crosses the section "the surface is good" and not rutted.

"Horses trot over the section" and the local users "seemed pleased with it." It is more resilient and



Applying the Pitch by Hand. Old Sand Bed Has Been Shaped as Described in the Article



The Pitched Sand Was Harrowed Thoroughly

to make four trips a day over the road between Sharptown and the railway station. Several parties began getting out timber, wood and telegraph poles, hauling them, for water shipment from Sharptown, over the new work.

Apparently, an insufficiency of larger particles (stone chips) in the mixture had been proved under the traffic conditions and, May 20th, 1912, the remedying of this condition was begun as follows:

The roadway was first scarified or loosened thorough-

easier on the horses' feet than the adjoining stone section "and does not get slippery under any conditions."

"The surface is not sticky, the motors do not skid on it, and there is no appreciable dust." "Under machines the surface does not appear to be damaged as is very noticeable on the nearby (waterbound) stone macadam."

During the last week in May and the early days of June, 1912, the repairs were made as stated and now

(October, 1912) the condition of the section is described as follows:

"The section is in fairly good condition. Some ruts have been made but in no place is the surfacing cut through. It appears to stand up very well under traffic, which includes the heavy motor truck above mentioned, but evidently has not received the necessary and proper maintenance. The surface appears to be such as to require a little constant attention over a considerable period of time rather than any large amount of work done within a short period, in order



This Picture Shows the Completed Road at Sharptown After One Year's Use

to keep it in the best condition. If it were not for a few ruts, the section would be most satisfactory. As fast as any rutting is indicated, the surface should be dragged and if this is done as needed, the surface will be kept in satisfactory condition."

The cost of the work to October 1st, 1912, has been as below:

Grading (1460 cubic yards)	\$ 440.73
Shaping	45.02
Pitch and freight	1317.56
Stone, freight and wharfage	896.14
Labor and teams	370.33

Total \$3069.78

or, on 4000 square yards of surfacing—\$0.76¾ per square yard for construction and maintenance one year.

In the opinion of the writer, the total expense to September, 1912, should not have exceeded two-thirds its actual figure, and the following mistakes were made:

Labor, pitch and stone chips were wasted, and "cultivating," at least, to the extent that was done, was undesirable. The harrow would have answered every purpose and an unnecessary thickness of the crust (fully 50 per cent in excess of the needs) would have been avoided.

The first applications of stone chips were too light, the chips were worked down (by cultivating) too far into the sand to be of value and at least 30 per cent of the total stone chips used were thus wasted. The larger amount finally applied in May should have been used at first and these harrowed only sufficiently to thoroughly mix them with the sand and pitch, leaving them when so mixed as near the road surface as possible.

Under such conditions, the cost should have been, as

above stated, not over fifty cents per square yard to date.

The rates paid for labor, teams and materials were as follows:

Foreman	\$3.00
Labor	\$1.24 to 1.50
Double teams	3.00
Single teams	2.00
Hire of steam roller	4.00

Pitch used on this job cost nine and three-fifths cents per gallon f. o. b. Sharptown and stone chips \$1.25 per ton f. o. b. Sharptown. The working day for which the above schedule of prices was paid was ten hours.

U. S. Office of Public Roads a Popular Lecture Bureau.

During the year 1912, 1,139 lectures and addresses were delivered in various parts of the United States by 27 representatives of the office of Public Roads. In 1910, 523 lectures were delivered and 723 in 1911. The total attendance this year was 208,472, while in 1911 it was 200,000. Lectures are included which were delivered in connection with road-improvement and agricultural trains. The total attendance at the lectures given in connection with the road-improvement trains during the year amounted to 99,259, exclusive of those delivered on the St. Louis & San Francisco Railroad.

All of the lectures were of a practical or scientific character and most of them were illustrated with lantern slides. Besides the lectures given in connection with road-improvement trains addresses were given at farmers' meetings and road conventions. Several papers were also read at colleges and universities and universities and before scientific organizations and societies. Short lecture courses on highway engineering were presented at the University of Idaho and at the University of Kentucky.

The names of the states and the number of lectures given in each are as follows: Alabama, 29; Arkansas, 14; Colorado, 4; Delaware, 5; District of Columbia, 2; Florida, 50; Georgia, 82; Idaho, 4; Illinois, 5; Indiana, 2; Iowa, 1; Kentucky, 13; Louisiana, 10; Maine, 6; Maryland, 13; Michigan, 38; Massachusetts, 4; Mississippi, 42; Missouri, 46; Nebraska, 1; New Jersey, 3; New York, 3; North Carolina, 142; North Dakota, 22; Ohio, 25; Oklahoma, 63; Pennsylvania, 12; South Carolina, 90; South Dakota, 3; Tennessee, 88; Texas, 164; Utah, 3; Vermont, 20; Virginia, 99; West Virginia, 22; Wisconsin, 5; and Wyoming, 4.

That this method of presenting information produces good results is shown by the fact that the applications have been entirely voluntary and that the office does not send lecturers to any community except upon request, and not then until it is assured that the meeting has been properly advertised and that the attendance will justify the expense. During the year it was necessary to refuse 85 applications for lectures.

Harry Brothers Company, of Newport, Kentucky, manufacturers of Harry's Corrugated Metal Culverts offer in their advertisement in this issue to send a length of culvert to those interested in road construction for examination. Their business is growing rapidly all over the south.

The \$390,000 good roads bond election recently held in El Paso county Texas carried by a majority of 10 to 1. This appropriation will be used in constructing more good roads in the county. Work is expected to begin at an early date.

Essential Requisites in the Making of a Highway Engineer

By STUART A. STEPHENSON, JR.

Rutgers College, New Brunswick, N. J.

AT THE suggestions of and in conjunction with Professor A. A. Titworth, the Head of our Department of Civil Engineering, the writer has prepared the following brief sketch as an introduction to the subject-matter of this symposium.

Present Practice.

The course at Rutgers College in highway engineering is practically a new one and, as yet, in process of development. It has been largely a lecture course because, while there are good books on highway engineering, no suitable textbook has been found to meet our purposes.

A book has come out this year, however, which we shall adopt as a text in the class-room for the present. ("A Handbook for Highway Engineers," by Messrs. Harger and Bonney, McGraw-Hill Book Co.) Supplementing the lectures, there have been problems in the classroom, draughting-room exercises, visits to locations where road construction is in progress, distribution of government and other pamphlets, and lectures by engineering in actual practice.

Policy.

The time is not sufficient nor the students prepared for specialization in highway engineering education. This branch of engineering has its place along with other branches. The purpose is to teach the funda-

ing and construction of roads and pavements, without specialization in particular methods or materials of construction.

In presenting this paper the writer comes not as the pedagogue or the academician but as the engineer-teacher, bringing to the task an intimate acquaintance of fifteen years in connection with highway as well as other branches of engineering and construction. He advances no theories, for the recommendations herein made were not only an integral part of his own technical training but have been substantiated by mature conclusions born of subsequent experience.

1. The education of the highway engineer should be professional rather than vocational or industrial.

2. It should be part of a liberal course in civil engineering, not a narrow and limited specialization.

3. Previous training.

Granted that the character of the course is to be professional, it is inadvisable to suggest any specialized preparation for a training requiring a broad and deep foundation. A few essentials, however, should be mentioned. Elementary mathematics, a thorough working knowledge of the English language, United States history, geography, elementary physics and chemistry and elementary drawing. One of the classics, preferably Latin, and one modern language, either French or German should be taken, also some simple form of manual training, such as carpentry, will prove of great practical value.

4. Professional Education.

The subjects included in the general training should be higher mathematics, including the calculus, mechanical drawing, geology, both structural and dynamic, and crystallography. Laboratory physics and analytical chemistry, English language and literature, including composition, rhetoric and public speaking, French, German, political economy, English and European history.

Those subjects of specialized bearing are plane surveying, principles of highway and railroad location and construction, analytic mechanics and hydraulics, masonry design and construction, mechanics and materials and roofs and bridges. Materials of construction should be carefully studied, that is, road-making materials such as trap-rock, granite, limestone, bituminous binders and dust preventatives, concrete, brick, wood and gravel. A short time could be profitably spent on the elements of electrical and mechanical engineering, with especial reference to the construction and operation of modern road machinery.

5. College Laboratory Training.

Strength of materials will be found of primary importance, such as that of cement, brick, concrete and structural steel. Likewise an investigation should be made of the characteristic properties of the many bituminous road-making materials now being used, to ascertain their relative merits and defects. The



A Gypsum Road Near Watonga, Oklahoma, Built by the Macadam Method

mental principles of highway construction which includes city streets. What constitutes a proper foundation and how it should be prepared, proper surfacing, gradient and alignment, proper drainage and the disposition of the run-off, proper gutters and sidewalks. Some of the economical advantages of a good road surface are explained as is also the manner of locating new roads. More special laboratory work is contemplated, but it is now carried on principally in connection with other courses.

The policy of the college is to acquaint the student with those general principles that govern the design-



Here is a Bad Advertisement For Checotah, Oklahoma. This Picture Was Taken From the Railroad Station, Looking Up Town, Checotah Has 3,800 People and Can Afford Better Streets

wearing qualities of these materials and their ability to withstand climate influences should also be carefully determined. Some laboratory practice in hydraulics will be found helpful though it is not necessarily essential.

6. Practical Experience during the College Course.

The student should be required during the summer vacations, to take field work in general surveying followed by field practice in railroad location and methods of construction, which not only includes but goes beyond the specific requirements of highway engineering.

The present practice of many technical schools is to be highly commended and should be included as a part of the work now being outlined, that is to take the students during the college term, on tours of inspection of large and representative engineering works, either completed or under construction, not only highway construction, structural steel bridge work, dams, water-works, sewage disposal plants, tunnels, railroads and other similar structures; in a word, the student should be given a comprehensive view of the entire field covered by civil engineering.

It is hardly necessary to emphasize the fact, that the student contemplating the adoption of highway engineering as his life-work should give especial attention, during his undergraduate course, to representative examples of highway and railroad construction, which are very closely associated in their fundamental details.

7. Subsequent Experience.

Once out of college, the highway engineer should turn his attention to the specialized aspects of his profession. One, or more if possible, of the representative

technical journals should be used as a medium for keeping in touch with the most recent developments relating to this particular branch of engineering or to kindred subjects. He should ever remain the active student and the conscientious investigator, and, in the pursuance of his work, should be a wide reader, consulting the best authorities upon the various topics of allied interests, so as to acquaint himself with accredited methods in each phase of his calling.

Extensive travel, involving an intelligent study of methods and practices at home and abroad, constitutes a most valuable part of a liberal education, and of a kind that can never be obtained within the four walls of a technical school. Under the broader applications of a comprehensive training, the laws governing the construction of roads by the federal government and in the different states of the union should be carefully studied so as to bring about such a uniformity of practice and a co-operation of effort as shall promote the extension of our national highways and the expansion of our industrial life.

And there is also a political side to the situation, which should be approached with some caution. The construction of roads in this country may properly be said to come under four (4) general classes of governmental supervision, namely, federal, state, county and township or municipal. Granted, as a matter of fact which admits of very little dispute, that each municipality should build and maintain the roads and pavements within its own borders, we have outside those limits the greater problem in the construction and maintenance of the vast avenue of commerce that stretch between our towns and cities.

What department of government is best fitted to su-

pervise this work? Is it the federal authority, the state, or the county? And what is the most equitable and efficient method of taxation for the construction and up-keep of such roads? It is for highway engineers to study these questions from every view-point and give to the public what appears to be the best solution.

In passing, the writer wishes to mention that reprehensible practice still surviving in some of our eastern states and known as "working out" the county road tax. In the fall of the year, after the crops have been harvested and there is nothing else to do, the farmers foregather and expend a few desultory efforts on a phase of their welfare that should be considered of primary importance.

At its best, such an attempt is nothing more than a cross between a "water-melon cut" and a "cider-sprees," and at its worst is a cause for shame and reproach in any civilized country or community. These same, apparently, shrewd and industrious men consider it a better investment to have a truck-load of produce mired hub-deep on a country road in the spring, than to expend a reasonable amount of money in a systematic scheme for highway repair.

It may not be amiss at this time to emphasize a few lessons from the past, to consider present needs and get a glimpse of the future. Both in city pavements and country roads, many causes of failure have been due to foundations of improper material and defective workmanship; while on the latter roads, obstructed ditches, causing insufficient drainage, together with small culverts and poorly built bridges, have often resulted in great, unnecessary expense and suspended traffic for long periods.

The writer's experience in tropical countries, where the erosive action of violent rain-storms is in many respects more destructive than that of frost in northern climates, has impressed upon him very forcibly the supreme importance of proper maintenance. And in view of these existing conditions, it is not far wide of the mark to say that this very problem of adequate maintenance constitutes one of the most necessary lessons that the American highway engineer has yet to learn. In connection with the maintenance of city pavements, especially, the writer feels called upon to emphasize the need of thorough and systematic methods of street cleaning, which shall produce proper sanitary conditions without undue annoyance to the traveling public.

What lines of investigation are directing our attention to the task of the future? The more detailed study and determination of the characteristic properties of bituminous and other materials of a similar nature, will go along way toward providing country districts with roads that are both economical and satisfactory. Further experimentation with the absorbent properties of semi-vitrified paving materials, in place of the freezing process as a test of their ability to resist the action of frost, is a matter well worthy of our consideration.

If the wonderful discoveries of science, as presented at the International Congress of Applied Chemistry recently held in New York, will actually give to the world a synthetic rubber at a low cost, then the highway engineer has within his grasp the possibility of the ideal pavement.

Above all the highway engineer should be a man of wide mental horizon and broad human sympathies. He must stand ready to hold to his convictions like

grim death if there is a fundamental principle involved, and, withal, must be willing to relinquish, at a moment's notice his most cherished theories when modern research and experience have proved them fallacious.

As the steam roads and suburban electric roads of our country increase in size and importance, so must our highways ever fill a supplementary place of equal importance, in this day of heavy trucking and high-speed automobile traffic. What the capillary system of the body is to the human circulation, so must the highway always be the vital connecting links between the ebb and flow of our modern railroad systems.

To the trained engineer must we look for leadership in this great movement, and may it be the constant aim and ambition of our technical schools to send out men who shall be able, in the near future, to give to the world such examples of the combined art and science of road-building as have been the pride and joy of the British Isles and of many European countries for a hundred years past.

Secretary Pennybacker Honored.

The Joint Congressional Committee on Federal Aid in the Construction of Post Roads has selected Mr. J. E. Pennybacker, Secretary of the American Highway Association, for the position of Statistician to the Committee, Mr. Pennybacker retaining his status with the association. Hon. Jonathan Bourne, Jr., Chairman of the Committee, has inaugurated an exhaustive study of the road systems of foreign governments and of the various states, in which he is displaying the same indefatigable energy and comprehensiveness of method which marked his conduct of the parcels post project. The selection of Mr. Pennybacker as statistician is in great measure due to his work as Editor of the Official Good Roads Year Book of the United States, a monumental work of reference on every phase of the road subject, the first edition of which was published by the American Highway Association in 1912. Carefully refraining from lobbying methods of promoting road legislation, the American Association has proven a most effective factor as a great advisory body in the framing of suitable legislation and as an advocate of basic reforms rather than individual measures. Its attitude on the question of federal aid was enunciated in the following resolution adopted at its last annual meeting at Atlantic City:

"This association looks with favor upon the investigation by the present joint committee of congress toward giving federal aid in the construction, reconstruction and maintenance of highways in the United States and pledges itself to co-operate with and assist that committee in every way possible toward an early decision and the preparation of and presenting to congress of an appropriate bill looking toward the immediate or ultimate granting of federal aid for highways for vehicle travel."

Sixty-one miles of gravel roads have been built in the Waco, Texas, road district during the past twelve months at a cost of \$92,000 while McLennan county has spent \$96,000 during the same period keeping roads in repairs and building and repairing bridges. During the year about 450 miles of county roads were kept up with split log drags costing the county \$1,058. A good roads bond issue is contemplated.

Trunk Line System of Highways

By MR. C. GORDON REEL

State Superintendent of Highways and Chairman of the State Highway Commission of New York

THE development of trunk line highways, as distinguished from improved market roads, is due primarily to the perfection of the motor vehicle. The state of New York is now building a very comprehensive system of such highways, aggregating a total mileage of 3514 miles, and it may be interesting to explain in detail the way in which this development came about.

In the first place: There are in the state of New York 80,000 miles of road, about 4,000 of which have been improved as state or county highways, 4,000 miles have been macadamized as town roads, 10,000 miles have been improved by towns as gravel roads, some 40,000 miles have been shaped to some extent and there are approximately 28,000 miles remaining in their original condition.

The whole development of improved roads in the state of New York came about as the result of discussion and agitation of the subject in various forms for a long period and culminated in 1898 in the enactment of the so-called Higbie-Armstrong law, the intent of this legislation being to begin the work of improvement of the highways of the state and \$50,000 was appropriated from the general funds of the state to provide for its share of the cost of the improvement, which, under the provision of this act was to be jointly borne by the state, the county and the town where such improvement was to be made, the state paying 50 per cent. the county 35 per cent. and the town 15 per cent. of the cost. The State Engineer and Surveyor, an elective officer, was charged with the duty of carrying out the provisions of this law and had entire charge of the work of highway improvement. Subsequent appropriations were made annually by the legislature during the following years from the general funds of the state for road improvement purposes, gradually increasing in amount until in the year 1905 the sum of \$1,000,000 was appropriated.

The legislature of 1906 amended the Higbie-Armstrong law by enacting the so-called Cobb law, which provided in place of fixed percentages of 50-35-15 that the respective shares of the county and town be based on a percentage to be determined by the assessed valuation. It is interesting to note that this was the initial departure from the original plan, which, as we see, has been deviated from more and more as time went on. Under the provisions of the graduated scale provided by the Cobb law the percentage to be paid by the wealthier counties and towns remained the same as originally planned although the poorer were reduced, the very lowest being 8 per cent. for the county and 2 per cent. for the town. The effect of this amendment was to reduce the amount of money available for highway improvement because the state was called to pay the difference between these percentages of 35 and 15, and the counties and towns of lesser valuation were thus relieved by the operation of this act.

Improvements under the provisions of this law proceeded in a random way, necessarily as from the fact that the initiative must be taken by the towns. In order to secure the improvement of any highway the supervisor of a town was required to present a peti-

tion therefor to the Board of Supervisors of the county. This petition being favorably considered by the board of supervisors a resolution describing the highway was adopted by the board and forwarded to the state engineer who thereupon caused a survey to be made from which plans and estimates were prepared, these plans and estimates forming the basis of the contract for the improvement. Certain features of the law provided for what was intended to be a general distribution of the improvements under this fund but from the fact that some localities were exceedingly slow while others were very quick to avail themselves of the provisions of the bill, an unequal distribution of construction resulted, this being no fault of those charged with the execution of the law because there was no way to compel backward localities to proceed with improvements.

Up to and including the year 1905 the work of improvement had been carried forward under appropriations made annually by the legislature based upon estimates by the state engineer and paid from the general funds of the state. At the general election of 1905 a constitutional amendment authorizing the insurance of bonds to the amount of \$50,000,000 was voted upon favorably and the necessary legal enactments were made by the next legislature and an appropriation from this bond issue of \$5,000,000 for the work of 1906 was made. This was the beginning of the work of improvement under the so-called \$50,000,000 bonding act. As improvements progressed it became apparent, that operating under the arrangement hereinbefore outlined, that the roads improved bore no relation to each other and that some steps must be taken towards attaining a continuous construction.

Just about this time, and it may be noted coincident with the development of the automobile, there arose a strong demand for the development of through trunk routes connecting the large centers of population to be built entirely at the expense of the state and to be the nucleus of a complete system of main arteries of communication.

In 1907 a law was enacted known as Chapter 751, directing the state engineer to prepare a map showing a comprehensive system of highways to be improved throughout the state. This map was to be prepared after consultation and advice with the county authorities of each county and the location of these routes made by the state engineer and adopted by the board of supervisors of each county. After these routes had been definitely located by the state engineer and the county authorities in each county a map was prepared by the state engineer and presented to the legislature upon which these routes were shown and which became the basis of the state and county highway systems provided for by the highway law which was passed in 1908 and which also created the State Highway Commission, becoming effective January 1, 1909.

Under the provisions of this act a state department of highways was created consisting of a state highway Commission of three members, together with the necessary subordinate officers and employees. This law also constituted three divisions of the State Highway

System, namely, state highways which were to be constructed at the sole expense of the state; county highways to be constructed at the joint expense of the state, county and town as before mentioned; and town highways to be maintained by a tax raised by the towns, supplemented by state aid, this state aid being based on the amounts raised by the towns at a varying percentage determined by the assessed valuation thereof and ranging from 50 per cent. to 100 per cent.

The state highways were described in the highway law of 1908 in a general way as running from the principal centers of population throughout the state, considerable latitude being left to the judgment of the highway commission in fixing the exact location of these routes.

The state highways, that is those constructed at the sole expense of the state, comprise approximately 3,500 miles connecting the principal centers of population and forming a skeleton system of which the county and town highways are tributary. Had the original plan of payment been adhered to the State Highway Commission would, as a result of the issuance of \$50,000,000 of bonds have had available \$100,000,000 for the improvement of the highways from the fact that the counties and towns were, under this act, called upon to pay an amount equal to that paid by the state. Subsequent amendments to the law have operated to materially reduce the possible available amount. The adoption of the graduated scale of payment of the county's and town's share reduced the available amount very materially. The adoption of the state

system by which the state paid the total expense operated to still further reduce the available amount. By subsequent amendments the state's share of the abolition of grade crossings was made payable from the \$50,000,000 the total effect of these items being to reduce the combined amounts of expenditure by the state, counties and towns to approximately \$65,000,000 instead of \$100,000,000.

As development progressed the demand for the completion of trunk lines grew apace because it was discovered that the construction under the original plan resulted in a disjointed, uncorrelated system. Chapter 532 of the laws of 1910 was the result of this demand providing as it did the so-called expediting of Route 6 between Albany and Buffalo, all of which is now practically completed. This law met with general approval and was signed by Governor Hughes and such was the popular demand for the early construction of through routes that the legislature of 1911 provided for the speedy completion of 1464 miles of these trunk line highways.

The propriety of this legislation has been questioned from time to time but without effect and it may be safely said that there has been no more popular legislation in connection with the whole highway development in the state of New York than the passage of the so-called expediting bills. It may be said that the whole development of improved highways in the state of New York is largely an altruistic proposition because approximately 85 per cent of the state's share of the cost of both state and county highways, as well as



New Macadam Street at Lexington, North Carolina. Looking Toward Town From the Winston-Salem Southbound Depot

state aid to town highways, is paid by the large cities of the state and it is an agreeable thought that these cities so willingly contribute to such a large extent and that the members of the legislature representing them have invariably been foremost in forwarding the laws for highway improvement. Their attitude might be characterized as one of good sportsmanship, and furthermore it is in no way sporadic but has been the same consistently from the first conception of highway improvement.

As regards the character of construction the trunk lines naturally are designed more liberally and built more substantially than the less important county highway. If it could be said that standards have been established they are that puddled macadam with hot oil surface treatment is the cheapest construction used, asphalt macadam on more important routes and so on to mixed asphalt macadam, bitulithic, and brick construction in the vicinity of large cities, the idea in every instance being to suit the construction to the traffic condition. One reason why the roads in Massachusetts have become so justly celebrated is that in that state the trunk line idea prevailed from the start. Had we been similarly fortunate in the way of highway legislation, today the state of New York would have a system of highways unequalled by any in the world. As development proceeds it would seem that perhaps after all, the ideal arrangements would be to build along no other lines than those of state trunk routes improving all other highways as town highways, more elaborately of course than is our present practice.

Not only are the main trunk lines being progressed at an unprecedented rate but following a suggestion of Mr. Frank D. Lyon, Secretary of the New York State Automobile Association, some four or five of the main through lines of travel have been designated by different colors. Bands 12 inches wide will be painted near the ground on telegraph poles, guard rail posts, etc., so that tourists at a glance by observing these colors will know that they are following the desired route. The idea has met with great popular approval and is being rapidly carried out.

Construction in the state of New York is progressing at an unprecedented rate and most of this construction is along the trunk lines. For instance, the former Highway Commission when it assumed office on February 18, 1909, took over from the state engineer 543 miles of highway under contract and during its term of offices put under contract 1,050 miles, a total of 1,593 miles. Of this mileage there were 1,122 miles of county highway and 471 miles of trunk line. The present commission upon assuming office on July 20, 1911, took over from the former commission 875 miles and have placed under contract 1,848, a total of 2,723 miles, and the increase in trunk lines development is made apparent by the fact that of this mileage 1,499 miles in county highways while 1,224 miles in trunk line construction. The rate of actual completion has increased more than 85 per cent. and at the close of this season's work will show an increase considerably in excess of 100 per cent.

The average cost per mile of the 1,050 miles of highway let by the former commission was \$11,452 and the average cost per mile of the 1,848 miles of highway let by the present commission is \$12,236. This additional average cost of \$784 per mile is due primarily to the increase in the cost of labor, materials and machinery, and also to the increase in trunk line construction calling as it has for more substantial, and therefore more expensive, work. A further reason for this increase is

the passage of the so-called Allen bill which, provided for the construction of state and county highways in cities of the second class.

A glance at the map of county highways will show how disjointed and ineffective the original system of construction was. Similarly the map of the state routes will indicate how comprehensive the present plan is and what a boon it will be to the people of the state of New York, as well as to visitors from other states, when completed.

With the completion of work now under contract approximately 3,200 miles of trunk lines will be provided. The short stretch from New York to the Connecticut line is now under contract and particular effort is being made to complete the lines on either side of the Hudson river to Albany and from Albany north to the Canadian line, thus completing the International Highway from New York to Montreal. Similarly, we are building from Albany west to Buffalo and from a point on the Hudson river west along the southern border of the state through Binghamton and Elmira to Jamestown with connecting lines from Binghamton to Albany and from Elmira north to the Albany-Buffalo route.

Would Tax Tobacco for Roads.

The constructing of a comprehensive system of national highways out of a tax imposed upon the consumers of tobacco is a proposition which Representative Warburton of Washington has embodied in the form of a bill introduced in the house. He proposes that a tax shall be imposed so light as not to be felt by the users of tobacco, but every puff of smoke from burning tobacco will represent a part of a system of highways.

The plan contemplates trunk lines connecting the capitals of the different states with the national capital at Washington and with each other and running to the different national parks. The cost of construction is to be paid out of a tax similar to that of 1879 on tobacco. It is calculated that the tax will raise \$80,000,000 a year, or more than twice the amount of internal revenue now collected.

Big Highway Convention at Asheville.

A convention is to be held in Asheville Wednesday February 12th, in the interests of the Great Southern National Highway, an ocean-to-ocean road that will mean great things for the south. Two thirds of the highway is now in use and great interest is being manifested all along the route in the completion of the rest of it.

Governor Craig has requested the governors of other states through which the highway will pass to send delegates to the meeting and a big attendance is expected.

It is planned to make the Central Highway of North Carolina and the Memphis-Bristol Highway in Tennessee, a part of this great highway. It will be located far enough toward the south to be an open road throughout the entire year and will afford a wonderful scenic route for tourists.

The farmers' transportation problem begins with the road that leads from his door to his school, his church, his mill, his gin, his postoffice and his market.

Bad roads are a tax and a fearful limitation upon the business and social life of country people.

Second Federal Aid Convention, March 6 and 7

Mr. Laurens Enos, president of the American Automobile Association, writes to the executive officers of the Southern Appalachian Good Roads Association and of the North Carolina Good Roads Association, asking that delegates be appointed to represent these organizations at the second Federal Aid Convention to be held in the auditorium of the Raleigh House at Washington, March 6 and 7. Practically every influential good roads organization in the land will be represented at this meeting.

Chairman George C. Diehl, of the A. A. A. National Good Roads Board, sends out a very interesting pamphlet calling attention to the Washington convention and describing the status of federal aid movement. He says:

Federal aid in highway construction is one of the oldest policies in our national history. Under the provision of the federal constitution explicitly empowering congress to 'establish Post Offices and Post Roads,' the federal government, in 1803, began appropriations for road building which were continued until 1832, when the building of steam railroads diverted the attention of National, State and local governments to this new means of transportation, to the exclusion of the highways.

The introduction of the automobile has made the highway again as important a factor in our national life as it was in the days of the stage coach and Conestoga wagon. The American Automobile Association in 1911 adopted, as the main item of its good roads doctrine, the resumption by the federal government of its ancient policy of highway construction as a means of inter-state communication.

The first Federal Aid Good Roads Convention was called by the American Automobile Association to meet in Washington in January, 1912. Forty-three states were represented by delegates on this occasion, those of 23 states having been officially appointed by their governors. Seventeen good roads organizations, 28 of the foremost commercial bodies of the country, and the American Automobile Association with its 44 state associations and 457 local clubs spoke for the most insistent road users of the country.

More than 100 United States Senators and members of congress participated in this convention, either by delivering addresses, attending the sessions, or by letters endorsing the federal aid proposal. Resolutions calling upon congress to appoint a commission to investigate, collect information, and report a plan for the expenditure of federal funds in highway construction were adopted. Before congress adjourned the first definite steps toward the end sought by the American Automobile Association had been taken by the federal government. A joint committee of the two houses was named to conduct the investigation proposed by the convention. This joint committee consists of: Senators Jonathan Bourne of Oregon; Boies Penrose of Pennsylvania; A. J. Gronna of North Dakota; Lee S. Overman of North Carolina and Claude A. Swanson of Virginia and Representatives D. W. Shackelford of Missouri; Gordon Lee of Georgia; Daniel J. McGillicuddy of Maine; Martin B. Madden of Illinois and Richard W. Austin of Tennessee. Five hundred thousand dollars was also appropriated to be expended under the joint direction of the postmaster-

general and the secretary of agriculture in experimental improvement of post roads.

The American Automobile Association is not advocating any particular routes or locations for roads to be built or improved by federal appropriations. In general, it advocates the use of federal funds only for interstate through routes, which shall be included in a system of national highways touching every section of the country. Its present interest, however, is in obtaining the resumption of highway construction and maintenance by the national government as a definite and fixed policy to be pursued for all time to come, and the provision of adequate administrative machinery for the proper supervision of the government's expenditures in road construction.

The Second Federal Aid Good Roads Convention has been called by the American Automobile Association to meet at the Hotel Raleigh, Washington, D. C., March 6 and 7, 1913. The purpose of this convention is to continue the work of concentrating the federal aid sentiment of the nation, and crystallizing it into definite and effective action.

Second Edition of American Civil Engineers' Pocket Book.

The second edition of Mansfield Merriman's American Civil Engineers' Pocket Book has just been issued by John Wiley and Sons of New York. From the standpoint of typographical and mechanical excellence the book could hardly be improved on. It is bound in flexible leather, stamped in gold, and though it contains 1475 pages, it is not at all unwieldy. It may be easily carried in the pocket of an ordinary coat. The type is clear-cut and distinct and there is no jumbling together of facts and figures, such as marks many publications of the kind.

The first edition of the Pocket Book was issued in 1910 and it met with a hearty reception at the hands of the civil engineers of the country. The book contained thirteen sections, with 75 chapters, 620 articles, 45 tables and 944 numbered tables. Sections 2 to 11 deal with civil engineering proper, while section one gave tables for mathematical computations and sections 12 and 13 deal with mathematics, physics, mechanics, meteorology, weights and measures. In the new edition all of these sections are included, with corrections and improvements, and two new sections added. Section 14 sets forth the elementary principles and facts of steam and electric engineering and section 15 is a comprehensive treatise on the latest practice regarding the construction and maintenance of highways and streets.

Section 15 is worth a great deal more than the price of the book, which is \$5. It was prepared by Mr. Arthur H. Blanchard, professor of highway engineering in Columbia University. Professor Blanchard has contributed frequently to Southern Good Roads and it is not necessary to tell southern road-builders who have followed his work and read his contributions in this magazine, that the subject is handled in a masterly manner. He covers the entire field of street and highway construction in a way that makes interesting reading for the trained highway engineer and the unskilled road-builder.



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THE NORTH CAROLINA LEGISLATURE AND GOOD ROADS.

The North Carolina Legislature has been in session more than a month and so far has done nothing worth noting. Numerous bills have been introduced whose passage would mean great things for the state, but none has become law. We confess to no little disappointment and disgust. The legislature is full of able men but they do not seem to be in harmony with the spirit of the times and there is no great leader in all that body of legislators to arouse them from their lethargy.

We confess that we can't understand their attitude toward questions of public interest. They are strangely mute on matters concerning which there can be no question as to the attitude of their constituents. They are strangely deaf to the voice of the people and the indications are now that the legislature of 1913 will go down in history as a do-nothing legislature.

For example, there never has been as much sentiment for the right kind of progressive road legislation in North Carolina as there is today. This legislation has been demanded by about seventy county good roads associations, by the North Carolina Good Roads

Association, by the North Carolina Press Association, by the Medical Association and by numerous other organizations, yet, it doesn't seem to have impressed the legislature to any great extent.

Another demand of the people, expressed in no uncertain terms, is a state highway department with an appropriation to furnish engineering assistance in road and bridge building to the various counties of the state. This could be accomplished with \$40,000 or \$50,000 and would cause a saving of more than half a million dollars to the counties of the state every year. The people of the state also demand that the able-bodied state convicts be put on the public roads of the state, as is now being done in the most progressive states of the south, instead of leasing them out to railroads and other private corporations, and the state receiving in return stock in said railroads, which is not worth the paper on which it is printed. This special favoritism to certain sections and certain people of the state is outrageous and should be stopped. Convicts should be put to work building roads to be used by the people, and for the general uplift of the state.

The people are also demanding that the state guarantee county road bonds, that is, take county bonds at 5 per cent and issue state bonds which can be sold at 4 per cent. and the 1 per cent difference, if put out at compound interest, will create a sinking fund and pay for the county bonds in forty-one years. This would not cost the state anything and would be a great help to the counties. With this legislation the state would go forward and make wonderful development in the next few years.

It was proposed by the North Carolina Good Roads Association and the automobile users of the state to tax all motor driven vehicles 50 cents per horse power, and in that way secure a fund from the people who are the most constant users of the roads to furnish engineering assistance for the construction and maintenance of roads and for the building of bridges. This legislation is being opposed by an occasional automobile owner who cannot see the great advantage it would be to him and also by certain state officials who feel that the burden of running the entire state rests solely upon them, and who think that all legislation should originate in their offices.

The proposition to put the state convicts to building roads has been approved by the prison commission, the department of agriculture, and almost every organization of the state interested in the welfare of the state. The farmers are especially anxious for the passage of this measure, because they do not believe that it is right for the state to use convict labor to compete with them in the farm products markets. Certain special interests, which have profitted immensely by the use of convicts in building railroads and in other operations, have a well-paid lobby at Raleigh to fight this bill to a finish. Will the representatives of

the sovereign people of North Carolina be led astray by the wily lobbyists of these special interests? It looks like that very thing is going to happen.

COUNTY SHOULD BE UNIT IN ROAD WORK.

The benefits to be derived from the construction of public roads in any county are not confined to that county, but very beneficial results extend to adjoining counties; and, in fact, are of direct value and benefit to the state as a whole. Public roads are the common property of all of the people of the state, and all have the right and privilege to use them, regardless of what county may have paid for their construction. It is, therefore very essential, if the best results are to be obtained in road work, to make the unit of this work as large as possible. At the present time it does not seem advisable for the state to be the unit and, therefore, the next unit in size would be the county; and every precaution should be taken, in raising revenue for the construction and maintenance of public roads, for the county to be the unit. There are many reasons why the county should be the unit in road construction and not the township.

First: If revenue for the construction of the roads is obtained by a bond issue, the county is able to issue its bonds at a much cheaper rate of interest than the township, and there is also a readier market for county than township bonds.

Second: County bonds are more apt to bring a premium than township bonds, and thus a greater amount can be realized by their sale.

Third: With the county as a unit, one road commission would have supervision of all the roads of the county; while with the township as a unit, various commissions would have charge of the roads in the separate townships.

Fourth: Less equipment is necessary for carrying on the road work with the county as a unit than when equipment has to be provided for each township.

Fifth: The chaingang is much more easily and economically handled when the county is the unit.

Sixth: The county can afford to employ a competent road superintendent, where it would be impossible for each township to employ such a man.

Seventh: Perhaps the greatest objection to any subdivision being the unit, except the county, is the fact that if townships begin to issue bonds for their road construction and build roads in these townships (and it is practically always the richer townships which start a bond issue) it will mean that these richer (usually urban townships) will get a system of good roads and the balance of the county will not be able to get roads for many years, or even generations to come, without some outside help. Not only do the rural townships need the roads but it is of advantage to the urban townships to have good roads built through all the townships of the county, inasmuch as such a system of good

roads will greatly increase the trade of one section of the county with another.

We are, therefore, very strongly in favor of the county unit for raising revenue for road work and of a county organization which shall have charge of the construction and maintenance of roads. And whenever the question of raising revenue for road work by a bond issue is taken up, we would earnestly urge that the people of the county be given an opportunity to express themselves by a vote as to whether or not they want a county bond issue. Then, if the county turns down the bond issue, we believe it is only right and just for progressive townships to issue bonds if they wish. But give the county the opportunity of issuing bonds before any township in the county undertakes the issuance of bonds for public roads.

Senator Jackson's Good Roads Bill.

Senator Jackson, of Maryland, has introduced in the senate of the United States the following bill to promote and encourage the building of modern highways by granting aid thereto under certain conditions:

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That whenever any state, acting directly or through any local governmental agency, shall have constructed and completed, subsequent to the passage of this Act, to the satisfaction of the Secretary of Agriculture, not less than one mile of modern public highway, on a route approved in writing by the Postmaster General, and when the said Secretary of Agriculture shall have so signified his approval thereof in writing, and when a statement in detail of the methods and costs of the said modern highway, duly certified by the state highway commission or similar body, by whatsoever name the same may be called, shall have been presented to the Secretary of the Treasury, together with the said approvals of the Secretary of Agriculture and of the Postmaster General, by the said state highway commission, or similar body, the Secretary of the Treasury is hereby authorized and directed to pay to the said state highway commission, or similar body, one-half the cost of said modern public highway as certified above: Provided, (a) That no payment shall be made in excess of the rate of \$7,500 per mile for the half cost mentioned; (b) that in calculating the said cost no account of or allowance for expenditures for rights of way, property damages, or royalties, patent, or copyrights shall be included.

Sec. 2. That the term "modern public highways" used in this act shall be understood to include roads, streets, avenues, and the necessary bridges for the same, but shall not include or embrace any road or way devoted exclusively to certain special kinds or means of traffic, or any road, street, or avenue within the limits of any town or city with a population of over two thousand five hundred.

Sec. 3. That the Secretary of Agriculture, the Postmaster General, and the Secretary of the Treasury shall each have full power to prescribe, by rules and regulations not inconsistent with the purposes of this act, the methods to be followed by the state for the securing of their respective approvals, as provided in section one of this act.

Sec. 4. That the sum of \$10,000,000, or as much

thereof as may be necessary, be, and is hereby, appropriated out of any money in the United States Treasury not otherwise appropriated, annually, for the purpose of carrying out the provisions of this act: Provided, (a) That no state shall receive in any fiscal year a greater sum in the aggregate than such a proportion of \$10,000,000 as is equal to the ratio between the public roads of such state and the public roads of all the states according to the estimates of the Secretary of Agriculture; (b) that any unused portion of the \$10,000,000 hereby appropriated for the fiscal year shall be returned to the treasury of the United States and shall lapse.

Sec. 5. That any modern public highway constructed or improved under the provisions of this act shall hereafter be known as a national road. Such a road shall be maintained by the state (or its agents) in which said road lies, to the satisfaction of the Secretary of Agriculture. The said Secretary of Agriculture is hereby empowered to issue, from time to time, such rules and regulations concerning this maintenance as, in his judgment, may be desirable in the premises.

Sec. 6. That if at any time the Secretary of Agriculture shall certify in writing to the Secretary of the Treasury that in the opinion of said Secretary of Agriculture the condition of any national road, built or improved under this act, is not satisfactory, or that such national road is not being properly maintained by the state in which said road may lie, then the said Secretary of the Treasury shall not pay to such state any further sum or sums under the provisions of this act until said Secretary of the Treasury shall be further notified in writing by said Secretary of Agriculture that the unsatisfactory condition or improper maintenance certified to as above by said Secretary of Agriculture has been satisfactorily remedied in the opinion of said Secretary of Agriculture.

Sec. 7. That this Act shall take effect when approved.

Senator Jackson's bill was referred to the committee on post offices and post roads. Concerning his bill Senator Jackson said:

"That good roads are desirable is a truism that need not be repeated and that federal help would stimulate road-building is also a proposition that needs no argument. The bill introduced by me today is designated to encourage the building of modern highways by granting aid from the national treasury in a way which, while stimulating the states to build roads, amply safeguards the United States against extravagance or ill-advised efforts in road-making.

"The plan is simply this: Any state may suggest a road to the Postmaster General for his approval. When at least one mile has been completed to the satisfaction of the Secretary of Agriculture, the Secretary of the Treasury is authorized to pay to the state one half the certified cost of the construction, not to exceed \$7,500 for the half cost per mile. This insures that the road be actually built before the United States is called upon to expend a dollar, while the maximum limit insures the United States against the high cost of certain constructions due to peculiar local conditions.

"In these two respects the plan is superior to that of the Swanson bill, which virtually makes the United States a partner with the states in the undertaking; divides the cost between the United States and the

states and places no limit upon the expenditure. This being a national law, it is not fair that the United States should be required to pay for local difficulties of construction.

"The bill carries an appropriation of \$10,000,000 annually, to be apportioned among the states according to number of miles of public roads. This would seem to be a more just method than according to population, as proposed in the Swanson bill. But in estimating the cost for the purpose of the federal aid, charges for rights of way, damages to private property, etc., are excluded, which is another guarantee that the federal government shall pay only for the actual road construction. Any part of the annual appropriation not used in a given fiscal year lapses. Furthermore, in order to confine the provision to roads in the ordinary meaning of the term, I have excluded streets in towns of over 2,500 inhabitants. There is a further provision requiring the states to maintain the road so built to a standard of efficiency prescribed by the Secretary of Agriculture, under a penalty of refusal of further aid until the required standard of efficiency is re-established.

"I believe that this is a bill which all advocates of good roads can afford to support. I believe it is as important to the material welfare of this country as any bit of legislation ever proposed. I shall use my utmost endeavor to secure its passage."



The Marengo county, Alabama, commissioners have contracted for the construction of two steel and concrete bridges at a cost of \$6,000.

The city of Kissimmee, Florida, will build four bridges over the drainage canal now under construction.

Sumter county, Georgia, will vote on the 26th of this month on a bond issue of \$90,000 to build concrete culverts and steel bridges.

The Forrest county, Mississippi, commissioners have awarded contracts for the construction of four steel bridges to cost \$7,421.

The Sullivan county, Tennessee, commissioners have ordered the construction of three steel bridges to cost, all told, about \$50,000.

At Huntington, West Virginia, a bridge is to be built across the Ohio river at a cost of \$3,400,000.

At Denison, Texas, a contract has been let for a \$60,000 bridge across the Red River.

One thing which makes the prospects of the Ocean-to-Ocean Highway look brighter than ever they have since the plan was broached a few months ago is the general interest that is being taken in it by those outside the automobile industry. Reports, especially from the western states, prove that the importance of the highway is being realized by men in all lines of endeavor. Chambers of Commerce in many cities are endorsing the movement, and the farmers of the west are also aroused to a pitch of enthusiasm, seeing in it the impetus for a country-wide good roads movement.

Road-Building, Road-Boosting and Road-Boosters Throughout the Nation

At the annual meeting of the Minnesota State Association of County Auditors Jan. 22 it was brought out that road construction in Minnesota may be seriously delayed by a misapprehension on the part of the counties as to the amount of money that will be available in 1913 for state aid in road-building. Mr. C. E. Nagel, of the state highway commission, told the auditors that state aid to each county would average \$3,700, while many counties have already made application for \$10,000 to \$15,000. He expects a great deal of trouble when the counties find out they can't get all they ask for.

* * *

Appointed by Governor Ferris of Michigan to represent that state at the 2nd Federal Aid Convention at Washington next month are: Edwin S. George, Roy D. Chapin, W. E. Metzger, F. H. Wheldon, all of Detroit; W. K. Prudden, J. E. Roe, Richard Scott, of Lansing; J. D. Dort, of Flint and M. C. Townley, of Jackson. Governor Ferriss is a staunch believer in the federal aid idea.

* * *

They are planning to get Uncle Sam's contribution of \$10,000 for a model road between Homer and Shreveport, Louisiana. The stretch of road is just about 50 miles in length and exactly fills the bill. The government requires that the road be used in the delivery of mail and every mile of the proposed road is covered daily by rural carriers. Congressman J. T. Watkins, who represents that section of Louisiana in the House of Representatives, is anxious to see his district secure the appropriation and is trying to stir up his people on the subject. He has taken the matter up with Governor Hall and State Highway Engineer W. E. Atkinson and results are looked for.

* * *

The Moline Mail, published at Moline, Illinois, says that the fine brick roads around Paris, Danville and Newman, are attracting a great deal of interest. Everybody in Illinois who has even heard of the roads seems anxious to move to that vicinity and the Mail does not wonder at it. When all Illinois is locked in deep black mud a brick roads section looks like paradise.

* * *

Figures issued by State Highway Commissioner Ely, of Michigan, show that the state has built 463 miles of state reward road since July 1 when the annual report of the highway commission was dated. Three hundred and eighty-two miles of road were built in the first half of the year.

* * *

Suffolk county, New York, claims that the state has been overcharging it on the highways built during the past two or three years and is asking for a rebate. The county claims that the state is due it \$34,697, which sum is the over-payment on roads at a rate of \$4,000 to \$9,000 per mile. Under the law the county is required to pay 50 per cent. of the cost of construction. County Superintendent of Roads A. O. Smith claims

that the county has been required to pay 50 per cent. of the estimated cost of each road, the estimates being made by the state highway department, and in cases where the contractor's bid fell under the estimate of the state highway engineers, the county was still required to pay the higher amount. Mr. Smith seems to have his facts on straight and the county may get its money back.

* * *

In Illinois the first Friday in March has been set aside as good roads day for the public schools of the state. This action was taken at the request of the Illinois Highway Improvement Association. Commercial organizations, woman's clubs, labor unions, agricultural societies and other organizations, will give prizes for the best essays on good roads in the different grades. Teachers are being asked to familiarize themselves with good roads questions and to emphasize the social, religious and commercial value of improved highways. Here is an example that other states may follow with profit. Southern Good Roads would like to see similar prize contests instituted in every public school in the south.

* * *

A bill providing for the reconstruction and maintenance of the old National Road from Cumberland, Maryland, to St. Louis, Missouri, and extensions to it that will make it a through highway from New York to the Pacific coast, has been introduced in congress by Representative William P. Borland, of Missouri. The National Old Trails Road Association is behind the proposition.

* * *

Mr. M. O. Eldridge, the government road expert, who has traveled extensively in the south in the interests of the road movement, is now in Arizona canvassing that new state from end to end, giving lectures at every cross-roads on road-building. Mr. Eldridge is not only a pleasing speaker but a splendid writer on road topics and has frequently contributed to the columns of Southern Good Roads.

* * *

New Jersey is one of the first northern states to come to the convict labor idea. The south has taken kindly to the idea of working convicts on the roads but the north has held back. New Jersey has tried the plan one season and Col. Edwin A. Stevens, state road commissioner of New Jersey, is enthusiastic over the results obtained. He says:

"The experiment of convict labor on the state roads which proved to be a success in one week, is only the beginning of good roads building beyond what we already have and at a price which will spread out the money of the state beyond its present confines."

* * *

One of the most important gatherings in the history of the good roads movement in Missouri was the meeting of the Missouri Highway Association at Jefferson City Jan. 29. The purpose of the meeting was to consider the various bills before the Missouri legislature

and formulate a comprehensive plan of road-improvement that would satisfy all factions in the state. The members of the Roads and Highways Committee of the House of Representatives met with the association and showed no little interest in the work of the body. Great results are expected from the meeting.

* * *

The Colorado Good Roads Association held a great meeting at Denver last month. There were more than 400 members of the association present. They agreed on a legislative bill which provides for the use of the entire internal improvement fund of the state on roads, bridges and highways, under the supervision of a state highway commissioner and an advisory committee. A complete reconciliation was effected between the warring factions of the association and it was a great get-together meeting. Mr. Leonard E. Curtis, of Colorado Springs, was elected president and Mr. W. H. Emmons was re-elected secretary. The next meeting will be held at Colorado Springs.

* * *

The Paducah Sun, hearing that over in Christian county, a sister Kentucky county, a big good roads association was scheduled for February 19th, and 20th, essayed to give the people of Christian county some mighty sound advice. The Sun said that McCracken county had been stirred even as Christian county was being stirred. Mr. D. Ward King had been at Paducah, had talked to a multitude of people and there was enthusiasm and split-log drag demonstrations, and all that sort of thing, but the people forgot about it the next day. The county commissioners looked on, apparently very deeply impressed, but they did not change their ways in the slightest and there are oceans of mud around Paducah and all through McCracken county and the future is not at all bright. The Sun advises the Christian county people to strike while the iron is hot. While the city of Hopkinsville, where the convention is to be held, is still full of visitors and the road-building spirit is still on rampage, lay hands upon and proselyte every man that shows the slightest interest in roadbuilding and nail him down.

Good advice that.

* * *

In Brenham, Texas, there is an organization of young men known as the Young Men's Business Association. This organization decided several weeks ago that Washington county had been in the mud long enough and it started a campaign for road improvement. Believing that the proper place to begin a missionary movement is at home the association started with Precinct No. 3, in which Brenham is located and Secretary Frank H. Dever, together with Charles A. De Ware and Henry Mueller, were commissioned to canvass the precinct and see every voter. They have already begun this work and have organized half a dozen or more local good roads associations. If they put their proposition through in Precinct No. 3 they will spread out to the county. If they fail, they will try again.

* * *

The Commercial Club of Florence, Alabama, is a hustling organization. Not content with the Rogersville-Waterloo road, running a distance of 50 miles east and west, which was completed recently, the Club is going after another highway, a north and south pike running from Florence to the state line and con-

necting with the pike road to Waynesboro, Tennessee. At a meeting held recently citizens of Florence subscribed \$19,000 to be used in the construction of this road and an energetic committee is out after the balance needed. Wayne county, Tennessee, is reaching out after the trade that should come to Florence and Florence people are not going to give it up without a struggle.

Florence is the county seat of Lauderdale county and has made startling progress in the past two years in many lines. It was the first county to accept the terms of the state in building new school houses, the first to avail itself of the farm land demonstrations, the first to take advantage of the state highway construction and the first county in the state to appropriate the \$20,000 necessary to secure the government postal highway. Through the lead of the Florence Commercial Club citizens have not only contributed liberally for improvements along many lines, but have been successful in reaching out for all outside aid in sight.

* * *

It is no wonder that parts of Indiana are traversed by roads that would disgrace the Hottentots of South Africa. Read the set of resolutions adopted by a crowd of farmers at Anderson, Indiana, recently:

Resolved, That we are opposed to a state highway commission, with power to control the road system of the county.

Resolved, That we are opposed to the repeal of that part of the road laws which permits the working out of road taxes on the local roads.

Resolved, That we are opposed to a state tax for the construction or maintenance of public roads.

The resolutions were adopted by an almost unanimous vote and copied in a newspaper of that town with comments denoting entire approval of them.

* * *

James L. Hamilton, of Grand Junction, Colorado, president of the Colorado section of the Midland Trail is urging his people to get busy and build this great road for Colorado. The American Automobile Manufacturers' Association is financing the road and will build it in time for the San Francisco Exposition. They will spend \$8,000 to \$10,000 per mile on the road and it is said that they prefer to run it through Colorado rather than to the north or to the south, on account of Colorado's wonderful scenery. Mr. Hamilton estimates that 500 autos per day will travel the trail and that autoists will spend in Colorado \$100,000 per day while in the state.

* * *

Messrs. C. R. Thomas and J. H. Eldridge, engineers of the U. S. Office of Public Roads, have been assigned to road work in Palacios Precinct, Matagorda county, Texas. They have completed the survey of the precinct and work on the actual grading and surfacing of the roads has been commenced. They have \$100,000 to spend and the roads are to be surfaced with shell.

* * *

The fact that the road-building system of Illinois is not able to cope with the problem of improving the highways of the state is proved by the reports sent to the legislative investigating committee by rural mail carriers. These show that farmers voluntarily do 72 per cent. of the road dragging and that only 15½ per cent. of the dragging is done by paid labor.

GOOD ROADS NOTES

GATHERED HERE *and* THERE

Alabama.

Fifteen counties have applied for \$2,000 each to be used in the construction and improvement of public roads and bridges. Applications for state aid money have been coming in since January 13, the day the state highway commission authorized the payment of the appropriations.

Ten of the counties will use the money in the construction of roads and five will build bridges. State Highway Engineer Keller is pleased that counties have realized that they have a chance to construct good roads at a small expense to themselves.

He believes that every county will ask for the 1913 appropriation. Last year several did not file their applications and as a result about twenty-five counties had to return some of the money to the state treasury, as they did not use it in the two years allowed by law.

The counties that have applied for the money are Coffee, Bibb, Elmore, Macon, Calhoun, Franklin, Talladega, St. Clair, Morgan, Dallas, Pike, Barbour, Washington, Sumter and Montgomery.

* * *

Georgia.

A great opportunity for county officials of Georgia, who are concerned with road-building and maintenance, says the Atlanta Journal, is offered in a special five-day course of instruction which is to be given by the highway department of the University of Georgia.

These lectures and demonstrations, beginning February the tenth and continuing through the fifteenth, will deal with practical problems such as every road superintendent or engineer is called upon to solve. They will be adapted, in so far as is possible, to local needs and will thus be of direct benefit to those who attend the school.

Among the subjects to be treated will be road materials, their selection and use, grade crossings, road location, culverts and abutments and, indeed, every question that is involved in the successful construction and upkeep of the state's highways.

The road officials of every county have been invited to attend the short-term school. All of them will find it profitable to do so. The highway department of the university is doing much to encourage scientific and economic road work and for having projected this particular enterprise it is especially to be commended.

* * *

Missouri.

That the good old state of Missouri is not yet out of the woods on the road question is shown by the attitude of the counties of the state toward the employment of competent highway engineers as provided in Article 5 Chapter 102 of the Revised Statutes, which was enacted in 1907. Referring to this act State Highway Engineer Curtis Hill said recently:

Article 5, chapter 102, of the Revised Statutes, is an enactment of the legislature of 1907 for county highway engineer wherein there is created in the several counties of the state of Missouri the office of county

highway engineer, which highway engineer, in general terms, is given direct supervision over the public roads of the county and over the overseers of the county and of the expenditures of all county and district road funds. There is a string to this, however, wherein the county court is given absolute control over the county highway engineer, and whose hands can be completely tied, and in many instances has been completely tied, by the county courts. Also the salary for the county engineer is fixed by the county courts of the several counties, with a minimum of \$300 and a maximum of \$2,000 per year. In many instances county courts which did not view the county highway engineer act favorably has set so low a salary that it is impossible to induce good men to fill the office. Lots of citizens, a great many road overseers, and in the township-organized counties the bulk of the members of the township boards have considered the authority of the county highway engineer as an imposition or an infringement upon their rights. All these things taken together has tended to stimulate rather than a minimize the original antagonism to the county highway engineer, until at the present time we find considerable opposition, and that the average ability of the county engineers of the state is not up to an equal standard with those of the first year following the enactment. There was an amendment to the county engineer enactment of 1907 in 1909 whereby the counties were given the right to suspend the county engineer act so far as it applied to that county, since which time about one fourth of the counties have suspended the act. A number of other counties are completely ignoring this enactment, until not many more than one-half of our counties have a county highway engineer. Owing to the above-mentioned conditions, several which do have engineers would be just as well off without any.

* * *

New York.

Senator Murtaugh has introduced a bill to reorganize the New York state highway commission. It conforms to the ideas of Governor Sulzer and of many with whom he has conferred before signifying his idea about the form of such a bill. It provides a single commissioner at the head of the department and a chief auditor who shall determine the accuracy of all expenditures and make a report that shall be submitted to the State Comptroller for final audit.

The commissioner is to be appointed by the governor with the consent of the senate, with a salary limit and with deputies and secretary who shall also have salary of which the maximum is stated in the bill.

There is much in the contention of Senator Murtaugh that the highway commission with three members with equal power and yet with divided responsibilities has been found insufficient.

When the second commission was created, that was made up of two state officers both very busy and a new member called the superintendent of highways. Still it was a three-headed and not single-headed affair and it is to put the department in charge of a single re-

sponsible head with a law that is explicit enough to work under with efficiency, that the new bill is introduced.

* * *

North Carolina.

The road situation in the Old North State is promising indeed. The state legislature, now in session, will pass several progressive road measures before it adjourns. Governor Craig, who was inaugurated January 15, is an earnest good roads advocate. In his inaugural address he had the following to say of highway improvement:

Improved highways are the arteries of the country. They create organized communities of isolated families and make these communities a part of the life of the great world. Dynamite and the steam shovel are making through the hills and through the granite of the mountains, pathways for the locomotive. The improved road would give the farmers access to the railroad, to the church and to the school during all the seasons of the year. Good roads stimulate improvement. They enrich the soil. They build anew the school house, the church and the home. They arouse ambition and generous emulation. They increase the value of every acre of land that they touch and the value of every man, woman and child whose house they pass. No community can hope for progress without the good road. We cannot have the benefits of modern civilization without it. It is not an expense; it is an investment that pays 100 per cent dividend every year. And more, it brings culture and contentment and a better social life. Every community in the state must have it. The cost is much less than it was a few years ago.

I think that a general statute should be enacted conferring upon the townships the power to levy taxes and issue bonds for road construction and providing administrative machinery. The counties can continue what they have been doing. The townships can complete it. The state should supervise and encourage this great work by lending its credit and by all practicable, feasible means. All available convicts should be worked upon the public roads. In this way they can be used more appropriately and more to the advantage of the public than in the cultivation of the field or in the mechanical arts.

* * *

Oklahoma.

The Oklahoman, published at Oklahoma City, says that State Highway Commissioner Sidney Suggs is planning to build a mile of demonstration road in every county of the state this year and is soliciting the aid of the railroads in the project. He hopes to have the railroads run over their lines a good roads train to arouse interest in the movement with lectures and demonstration work, after which he will discuss the proposition with the commercial organizations along the proposed route with the end in view of building a mile of object lesson road in each county so traversed.

The communities in which the plan is favorably received will be required to furnish the necessary materials and part of the tools. Goltry, in Alfalfa county, has already asked for an object lesson road and Colonel Suggs will take an engineer there on February 4, when a road will be built along the same lines as those built in Warner, Checotah and Red Rock, where eleven miles of model highways have been constructed. Stillwater is anxious that a demonstration

for good roads be made and it is hoped by the department of highways that every county seat in the state will ask to be placed on the itinerary of the proposed good roads demonstration work.

* * *

Texas.

Hon. H. B. Terrell, of West, Texas, representing Senatorial District No. 8 in the 33rd legislature, has prepared a bill which will be introduced in the senate, proposing to create a non-salaried highway commission of five members, with authority to employ a skilled highway engineer at a salary not to exceed \$4,000 per annum, whose duty it shall be to make a general highway plan of the state, to gather information and compile statistics relative to the mileage, character and condition of the highways of the different counties of the state, and give the county commissioners the benefit of his counsel in matters pertaining to road construction. The department is to receive its support from a tax of \$2 per annum on automobiles.

The necessity for a public highway department on some sort of basis is generally recognized, and the bill prepared by Senator Terrell opens up the subject for legislative discussion. The enormous loss which the public highway fund undergoes annually through lack of skillful supervision in expenditure would many times support a public highway department. There is approximately \$10,000,000 per annum spent on the highways of the state.

* * *

Tennessee.

The report of the director of the United States Office of Public Roads, Mr. Logan Waller Page, contains the following encouraging account of the work done on the Memphis-Bristol Highway:

The Memphis-to-Bristol highway commission, eastern division, called upon this office in the fall of 1911 for assistance in advancing the construction of the road projected from Nashville to Bristol, Tenn., and guaranteed the expenses of an engineer under the customary rules of the office. Separate applications were required from each of the counties requesting assistance, and on January 8, 1912, an engineer was assigned to the general supervision of the work, with headquarters at Nashville.

Surveys were organized, in most cases under the county surveyors, and general plans were drawn up for uniform methods and construction for the entire road.

The eastern division of the highway from Nashville to Bristol is 347 miles long. Of this, 183 miles were already macadamized, 19 miles were toll road, 21 miles had been graded, and 143 miles were unimproved. Many of the unimproved sections were little more than trails, and grades entirely prohibitive existed at several places. Much of the unimproved road required entire relocation, in some instances departing several miles from the old road.

The project developed along larger lines than expected by the counties and considerable difficulty was at first experienced in raising and appropriating sufficient funds for adequate construction. This difficulty has never been wholly met and much of the construction as planned is lighter than it should be, but it is expected to improve under the maintenance with the annual funds of the counties concerned.

On June 30, 1912, the project as a whole was advanced

ed as follows: Preliminary surveys, 84.6 per cent; final surveys, 57.3 per cent; and work contracted for, advertised, or under force account, 79.1 per cent. Preliminary surveys have been made of 159.2 miles and final location established for 85.2 miles. Contracts have been advertised or let for 85.5 miles. The maximum grade will be 5 per cent.

Work has been done in eight counties—Cannon, Carter, Cumberland, Loudon, Roane, Warren, Washington and White. When completed the road will provide a way across the Cumberland Plateau at its most attractive part, having easy grades at all points and in many places magnificent scenery. It will open up a section that is sparsely settled, highly productive, and, until the opening of this road, without any adequate transportation routes. In the other counties the Memphis-to-Bristol highway follows generally the locations of existing roads.

The successful administration of this project under an engineer of this office, acting in a supervisory capacity for all the counties, is an example of effective work that may, under suitable conditions, be developed very largely where counties are unable to join in united action on road matters.

D. Ward King, the inventor of the split log drag, talks plain. He does not believe in soft-soaping any sort of proposition and when a people have been lazy, indifferent and unprogressive, he does not fail to tell them about it. Apparently he found a slothful, backward community at Rogers, Arkansas, recently, for this is what the Republican of that town said about him:

"Mr. King seemed to have a grouch on in Rogers, especially in the evening when he talked to the Commercial Club. He scored the club, was really insulting to J. W. Stroud, who is as much interested as he is, and especially in Benton county. When he left the commercial club meeting he backed out as if he was leaving a den of lions.

"However, some things he said, were needed to be said, but King should leave a much better taste in the mouths of the people than he did in Rogers."

Good for King! What the people need is not the "good taste" the paper talks about but the truth. It is sometimes necessary to give a patient medicines that do not taste at all good and it is the same way with sick communities. They should be told plainly just what is the matter with them.

State Superintendent of Highway C. Gordon Reel, of New York, when asked by Senator Jonathan Bourne, chairman of the congressional investigating committee, to give his idea of how federal aid should be extended to road-building, urged that the most practical plan would be for the federal government and the several states to join in furnishing funds for the work, the state having actual charge of the work of improvement and the federal government having general supervision of the work. "I advised Senator Bourne," said Mr. Reel, "that the amount of aid to each state could be determined by a graduated scale of payment to the different states, the percentage of the scale being determined by the assessed valuation of each state (the poorer states being entitled to a higher percentage and the more wealthy to a lower), and the amount to be paid fixed by computing this percentage upon the amount raised by the state itself for the purpose of repair and maintenance as a basis."

GOOD ROADS NOTES IN BRIEF

Bad roads make three miles equal to ten and take three hours of man and team when one should suffice.

Good farming, good schools, good churches and good social conditions do not lie along bad roads.

A meeting will be held at Johnston City, Texas, soon in the interest of the San Antonio, Blanco and Granite Belt Good Roads Association. The promoters of this road plan to build the finest macadamized road in the state of Texas from San Antonio north through the counties of Comal, Blanco, Burnet, Williamson and Travis.

Many prominent roadbuilders and men of prominence in other lines attended the sessions of the Alamo-Victoria-San Jacinto Highway Association at Victoria, Texas, last month. Nine counties were represented at the meeting and satisfactory progress in all of them was reported. A movement is on foot now to build a highway between San Antonio and Houston by way of Victoria, Seguin and Gonzales.

Scott county Virginia, will construct a bridge across Clinch river.

The city of Charlotte, North Carolina, will issue bonds for street improvement to the amount of \$50,000.

At a cost of \$65,000 Clay county, Missouri, will construct nine miles of improved road.

Kansas City, Missouri, recently voted \$300,000 worth of bonds for street improvement.

Yazoo county, Mississippi, recently authorized the issuance of \$300,000 worth of bonds for road building.

The city of Edgewood, West Virginia, has awarded contracts for 29,000 square yards of bitulithic and three and one-half miles of curbing.

The city of Marshall, Texas, has awarded contracts for the laying of 12,000 square yards of paving.

At a cost of \$100,000 Rome, Georgia, has contracted for the construction of 11 blocks of sheet asphalt paving.

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Texas Good Roads Bond Elections

A RECORD kept by the Texas Commercial Secretaries and Business Men's Association on good roads bond elections held in Texas during the year 1912 shows that thirty three bond elections carried in various counties of the state resulting in a total of \$3,496,200 being voted for highway improvements. Altogether there were fifty good roads bond elections held in forty-one counties, seventeen of which resulted in the issue being defeated. A sum total of \$5,603,700 was voted upon during the year. The amount of funds on hand January 1, 1912, raised by appropriations and issues of bonds prior to that date was approximately \$4,504,456, making a total of \$8,000,656 available for road construction for the year, subsequent to the sale of bonds.

Besides the above amount many counties of the state issued scrip for road work during the year which will be redeemed at some date in the future. In addition to this many counties worked their roads out of a fund raised by voting a special tax which with their regular road tax was sufficient to keep up their highways. It is estimated that about one-fourth of the highway improvements carried on in the state during 1912, was accomplished in this manner.

Many counties and precincts have spent as high as \$5,000 per mile for road construction during the year with the result that transportation has been cheapened, land values advanced and the population of the districts served by these high class highways increased to such an extent that the added valuation of the property thus affected will more than take care of the bond issues.

While the above amount was expended per mile for good road construction in many counties of the state, it was the exception rather than the rule, the general average running about \$3,000 per mile.

Robertson county took the honors for voting the largest sum for highway improvement during 1912, with a total of \$500,000 good road bonds voted in four separate elections. El Paso county came second with \$390,000 while Fort Bend county was third voting \$355,000 in three elections. Wharton county voted \$300,000 in one election while Montgomery voted \$250,000. In El Paso county it was necessary to hold two elections before the bonds carried. The first election held in August resulting in a defeat of the issue while in the December contest the issue carried by an overwhelming two-third majority. In practically every election in which the bonds were defeated the returns showed a majority in favor of the issue but as a two-thirds count is necessary to carry the issues were lost for the time being. However, plans are on foot in nearly every county where the elections failed, for another contest in the near future and in many cases the date has already been set for the second ballot upon the issue. Commercial clubs all over the state are endeavoring to create a sentiment among the rural people for good roads and have in most cases been instrumental in bringing about the successful result in the bond elections.

While large amounts of bonds were issued by the various counties, and districts of the state during the past year for road improvement and much activity in good roads building has been in vogue for the last several years, the state of Texas itself has done nothing to aid

or encourage the building of good roads and has so far taken no steps to see that the vast sums being raised for this purpose are being wisely spent.

The recent report of O. E. Dunlap, of Waxahachie, Texas, Chairman of the good roads committee of the Texas Welfare Commission to the Texas Commercial Secretaries and Business Men's Association, recommending the creating of a state highway department and it is likely that several bills proposing legislation affecting public highways will be introduced during the session of the Thirty-Third Legislature as a result.

The federal government recently appropriated \$10,000 to assist in improving a stretch of Texas highway fifty miles long and this amount will be increased \$20,000 by Tarrant, Palo Pinto and Parker counties and the total expended upon a highway connecting Fort Worth with Mineral Wells.

The total mileage of graded roads in Texas approximate about 35,000 miles which includes all highways under the class improved. Of this mileage approximately 7,000 miles have been given sufficient attention to enter them into the higher class of improved highways. The greater portion of the class of highway considered improved is surfaced with either mud shell, gravel, macadam, crushed rock or sand clay. A recent census on the number of split log and steel drags used in the state compiled by the Texas Commercial Secretaries & Business Men's Association showed a total of 656 in use in 51 counties of the state.

The Roanoke (Va.) Automobile Association has voted from its treasury the sum of \$300 to be used in the improvement of the Williamson road and a section of highway between Cloverdale and Troutville.

Callahan county, Texas, votes on the 15th of this month on a bond issue of \$75,000 for road-building.

Pasco county, Florida, will vote the 17th on a \$150,000 bond issue for the building of improved highways.

Dickens county, Texas, will vote this month on a bond issue of \$100,000 for road improvement.

On February 18th Eastland county, Texas, will vote on a bond issue of \$60,000 for road-building.

Jefferson county, Alabama, the county in which is situated the wealthy city of Birmingham, is keeping up its road-building record. Contracts were awarded recently for the surfacing with asphalt of about fifteen miles of macadam roads.

Brooksville, Florida, will spend about \$20,000 in constructing ten blocks of vitrified brick paving.

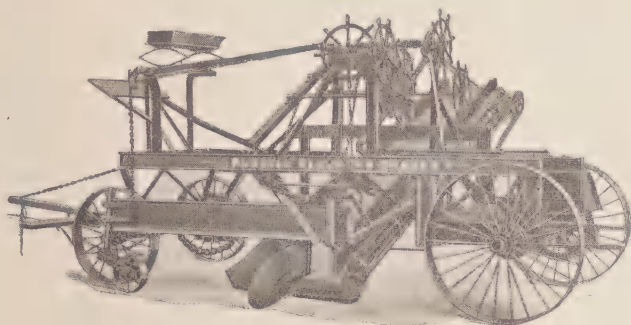
The town of Clearwater, Florida, will spend \$90,000 in paving with vitrified brick 32,000 square yards of streets.

New Orleans has contracted for the paving of the river front with small granite blocks on a concrete base at a cost of about \$50,000.

A new idea in road-building for motor traffic exclusively comes to the front in Georgia. The Dahlonega and Gainesville Transportation Company will construct 25 miles of road between those two towns for motor passenger cars and freight trucks. The road will consist of two parallel surfaces 16 inches wide with flanges on the outer sides eight inches high. These surfaces will be on stone and concrete.

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Frame is made of six inch channel steel, also has a center beam, and is braced with structural steel which has greatest strength with least weight. Carrier roller boxes are dust proof. Entire machine lubricated by compression grease cups. Most substantial wheels.

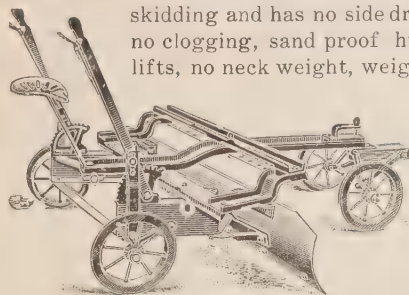
It Builds Road Grades At 2 1-2 Cents Per Cubic Yard

This is only one-fourth the cost of such work with scraper. Some customers report costs of less than 2 cents per cubic yard, but our claims are conservative.

We warrant moving 1000 yards per day or loading 500 to 800 $1\frac{1}{2}$ yard wagons per day.

Simplex Russell Reversible Road Machine

is the most efficient *one-man machine* on the market that is strong enough for four or six horses. Has no equal for grading roads, leveling, cutting ditches for drainage, etc. All steel, full sized blade, 7 ft. 3 in. long, 16 in. wide, removable cutting edge, equipped with flanged wheels to avoid skidding and has no side draft. Arched beam, no clogging, sand proof hubs, powerful lever lifts, no neck weight, weight 850 lbs.



Also made in two other sizes, "Giant Simplex" weight 975 lbs., and the "Kid" weight 450 lbs. Free trial on request.

We make a full line of earth handling and road building machinery—Elevating Graders, Road Machines of all sizes and prices, Buck Scrapers, Wheel and Drag Scrapers, Road and Railroad Plows, Road Drags, Grader Disc Plows, Snow Plows, Corrugated Metal Culverts, Culvert Molds, Steel Bridges, etc.

Get our big catalog which is free for the asking.

Russell Disc Plow

The best plow for general use on an elevating grader. Saves on power and has a larger capacity. Scours in any soil, throws dirt high on apron and cuts a clean furrow. Rolls over obstructions. Try it five days at our expense.

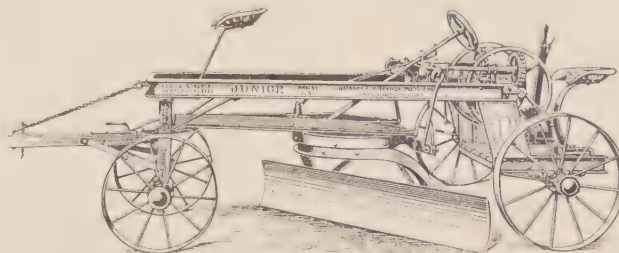


Russell Junior

Reversible Road Machine

is most practical and efficient four horse machine for general light work. It has strength, durability and the widest range of adjustments. Receding platform. One piece axle both rear and front. Patented rear axle shift. Blade seven feet three inches long. Steel wheels with removable boxes, sand proof hubs and hard oil cups.

This type machines also made in two larger sizes. Standard Russell Reversible for eight horses, weight 3,000 lbs. and the Traction Special, for engine power, weight 3,500 lbs.



RUSSELL GRADER MFG. CO.

2230 University Ave. S. E.

Minneapolis, Minn.

GOVERNORS' OPINIONS OF GOOD ROADS.

Twenty-nine governors have appointed delegates to the second Federal Aid Convention that meets in Washington March 6 and 7. Some of these governors are enthusiastic advocates of road improvement. Here are some quotations from their letters:

Governor Hunt of Arizona:—"I am heartily in favor of every movement tending to further the good roads cause, and I trust the delegates I have named will take a keen and beneficial interest in the work of the convention."

Governor Brewer of Mississippi:—"I heartily favor everything that promotes the building and maintenance of good highways."

Governor Ammons of Colorado:—"I assure you I am in sympathy with the idea of Federal Aid for the construction of public highways."

Governor Miller of Delaware:—"You may rest assured that anything I can do to promote the good roads movement, either in Delaware or elsewhere, I shall do."

Governor Sulzer of New York:—"There are few questions before the country today which mean so much to the present and future generations as the cause of good roads."



Studebaker

"Confidence" Cicero rightly said—

"Is that feeling by which the mind embarks in great and honorable courses with a sure hope in itself."

Confidence is the basis of all satisfactory business transactions.

The Municipalities of this country have confidence in Studebaker and their products because the **Equipment bought on our representations have made good.**

We build Sprinklers, Sweepers, Pneumatic and Power Flushers, Distributors for road building and dust laying materials, Garbage Wagons and Carts, Bottom Dump Wagons and Boxes, Street Cleaners' Carts, Vehicles, Harness, Automobiles. Catalogs and complete details upon request.

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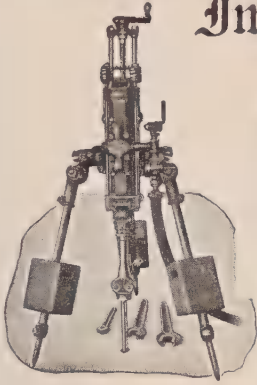
VITRIFIED TERRA - COTTA PIPE
for Road Culverts--Not only the BEST, but the CHEAPEST. Why pay one to three hundred per cent more and get less value? Hard burnt vitrified shale rock pipe *cannot* disintegrate. Has any other culvert been tried long enough to prove that fact?

Our new shale Pipe is unsurpassed in quality and strength. It is used exclusively by North Carolina Counties where highway improvement has long been under way. Prices on application.

POMONA TERRA COTTA CO., Pomona, N. C.

Annual capacity 1900 Cars

Improved Wood Rock Drills



Makes the hardest job easy besides being the shortest cut to the finished job.

In a Wood Drill you use to its full capacity every ounce of steam or air pressure entering the cylinder. This so reduces resistance that the bulk of the force is directed on to the work. Cannot freeze up with either air or steam. Our guarantee against defects last the life of the drill. Write for our catalog.

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Agents: Baskerville & Co., Title Guarantee Bldg., Birmingham, Ala.
E. F. Craven, Greensboro, N. C.



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THE ROMAN ROAD: The ever recurring tendency to return to "first principles" is exemplified in the glutrin road, which is a revival of the idea underlying the Roman Road, but in a simpler and much less costly form.

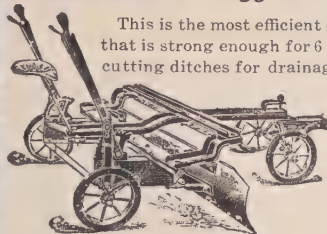
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General Offices:

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SIMPLEX RUSSELL REVERSIBLE

Road Machine "Biggest Little Grader on Earth."



This is the most efficient one man machine on the market that is strong enough for 6 horses. Has no equal for leveling, cutting ditches for drainage, grading roads, etc. All steel,

full sized blade, 7 ft 3 in. long 16 in. wide, removable cutting edge, equipped with flanged wheels to avoid skidding and side draft, arched beam, no clogging. Sand proof hubs. Weight 850 lbs. Get our Catalogue.

Write for our trial offer.

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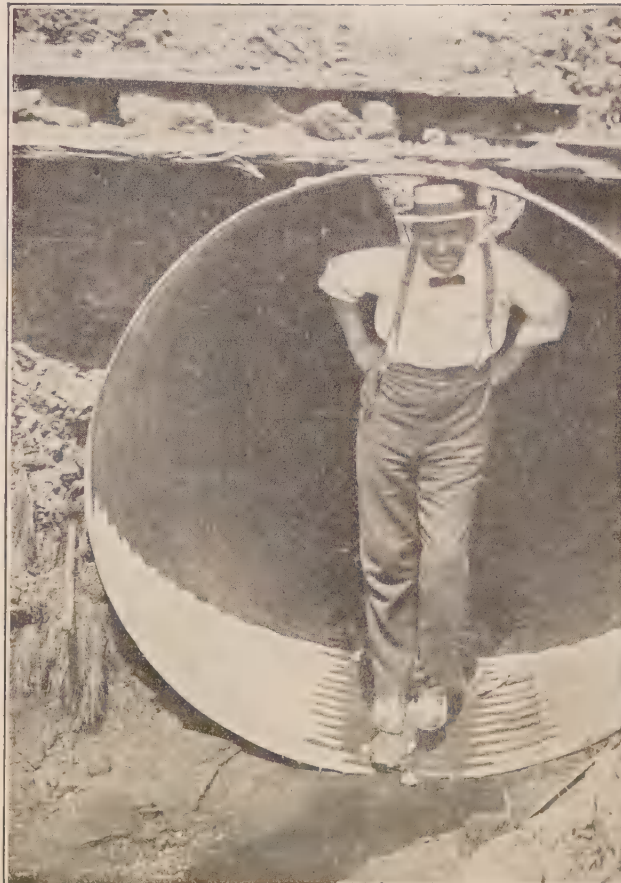
72 Inches in Diameter

Our customers say our Corrugated Metal Culverts are constructed with more care than any others they have ever used.

Naturally we believe what they say is true.



**HARRY BROS.
COMPANY**



Under 20 Foot Fill

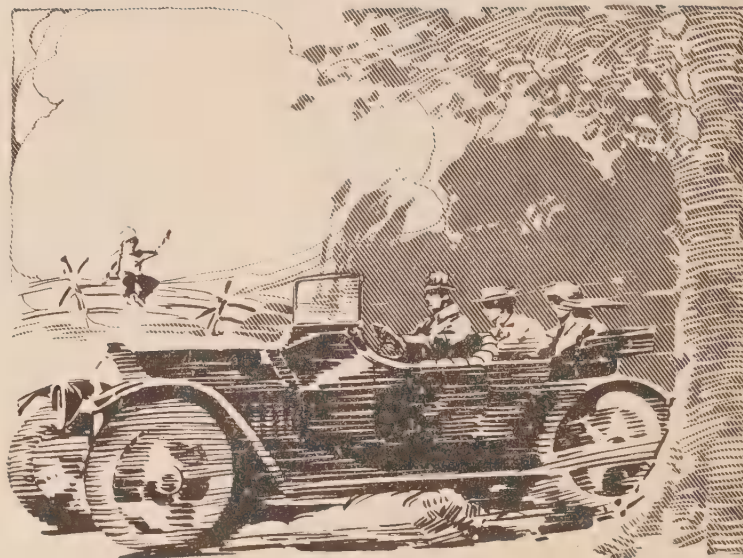
However, should you not be convinced by what we tell you let us ship a sample length or two, that you may inspect them to your own satisfaction.



NEWPORT, KY.

NEW ORLEANS, LA.

Mitchell



THE 1913 Mitchell makes three strong, favorable impressions on the man who wants to buy a car ; the first by the way it looks ; the second by the way it is made---the details of its construction and equipment ; the third by the way it runs when he is taken out for a demonstration.

All exaggerations and sensationnl effects are eliminated in the design of the Mitchell ; its lines are those of simple elegance and utility, developed by our engineers along the lines of the best foreign cars.

The man who examines the 1913 Mitchell carefully will soon satisfy himself that no other car at anywhere near the price offers so complete a combination of the newest improvements developed in the motor industry. All the essentials of the highest-priced automobile are in this car---the things that assure power, speed, comfort and convenience.

In the case of the Mitchell, moderate price does not mean "moderate" workmanship or materials ; only the best available of both have been utilized---built according to the same standards that have made Mitchell vehicles famous for the past 78 years.

All 1913 Mitchell cars have left drive and center control ; Bosch ignition ; Rayfield carburetor ; Firestone demountable rims ; rain-vision windshield ; Jones speedometer ; silk mohair top with dust cover ; Turkish upholstered cushions ; Timken front axle bearings ; guages on the dash to show air pressure and oil pressure ; guage in gasoline tank showing amount of gasoline it contains ; and a portable electric lamp which also illuminates the instruments on the dash.

All with T-head motor, electric self-starter, electric lighting system, and 36-inch wheels

	Motor	Wheel Base	Price F. O. B. Racine
7 passenger Six	60 H. P. 4 $\frac{1}{4}$ x 7 in.	144 in.	\$2,500
2 or 5 passenger Six	50 H. P. 4 x 6 in.	132 in.	1,850
2 or 5 passenger Four	40 H. P. 4 $\frac{1}{4}$ x 7 in.	120 in.	1,500

DEALERS EVERYWHERE

Mitchell-Lewis Motor Co.

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Branches: New York, Philadelphia, Atlanta, Dallas, Kansas City
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What Becomes of Your Profits ?

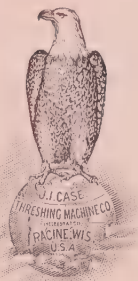
Before the spring rush of activity---before you are swamped with the details of new work---wouldn't it be well to find out why your last season's jobs were not as profitable as they should have been ?

Your profits depend on many things, but the biggest factor---the most vital element---is the efficiency of your equipment. No matter how favorable all other conditions, if your equipment is not capable of economical production your business can not be profitable.

Here are some of the things that consume your profits. Roller wasting time---high upkeep cost---excessive use of fuel and water---inaccessibility of working parts. Poor work---heavy draft---and inability of grader to stand up under heavy service. Rock Crusher breaking down and delaying all your other work.

In CASE Road-Building Machinery all chances of such occurrences have been reduced to the minimum. Durability and economy are built right into it. Contractors and Road Builders attest its merits---its profitableness. Counties, Towns and Cities that use it are highly pleased because of the money it saves in municipal work.

CASE Road-Building Machinery has stood the test of efficiency. It has proved its ability to do the best work in the shortest time, at the least cost. For seventy years the Case Company has had a world-wide reputation as manufacturers of dependable machinery. We can not afford to endanger this reputation by putting on the market an unworthy product.



Ask for the CASE Road-Building Machinery Catalog. It describes and illustrates our entire line---Rollers, Tractors, Graders, Scrapers, Drags, Rooters, Plows, Rock Crushers, Stone Screens, Stone Bins, etc. Write now. Your request will have prompt attention.

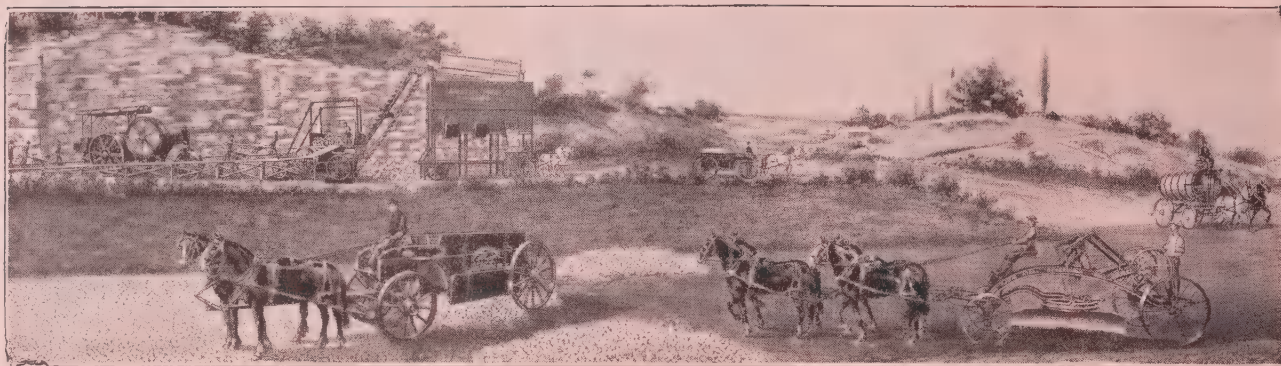


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AUSTIN WESTERN MACHINERY
FOR
Earth Handling Rock Crushing Road Making



The picture represents a first-class Austin-Western outfit at work :---

The Austin Grader preparing the road bed

The Austin Motor Roller furnishing power for

The Aurora Steel Rock Crusher equipped with

The Aurora Elevators, Screens and Stone Bin

The Austin and Western Dump Wagons distributing stone for

The Austin Motor Road Roller to consolidate and

The Austin Sprinkler to form the binder

Supplemented by our line of elevating graders, wheel and drag scrapers, road plows, scarifiers, etc., our outfit insures to the Road Builder harmony, efficiency and economy in every step of road construction.

Sold and fully guaranteed direct from Makers to the Users.

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Durham, N. C.

SOUTHERN GOOD ROADS

A MONTHLY MAGAZINE DEVOTED TO HIGHWAY AND STREET IMPROVEMENT

Vol. VII. No. 3.

Lexington, N. C., March, 1913

10c. a Copy



Macadam Road in Orange County, Virginia

PUBLISHED BY

SOUTHERN GOOD ROADS PUBLISHING COMPANY
LEXINGTON — NORTH CAROLINA

STANDARD

Asphalt Macadam Binders and Asphalt Road Oils



Morehead Ave. and Duke Street, Durham, N. C. Treated With Standard Asphalt Macadam Binder

STANDARD ASPHALT BINDERS are made in three grades, "A," "B" and "C," for use under varying conditions of road maintenance and construction.

These products are absolutely pure, containing 99 per cent. bitumen, and can be manufactured to any consistency desired. The three grades "A," "B" and "C" will be found to solve all problems of road surfacing or road construction that are ordinarily met with.

BINDER "A." A semi-solid product to be applied hot over stone or gravel roads subjected to heavy automobile travel. A covering of sand or screenings is necessary after Binder "A" is applied.

BINDERS "B" AND "C." Solid products used for road construction under the penetration or mixing methods—many hundreds of miles of roads in all sections of the country speak for the uniform success of these products of producing **DUSTLESS, PERMANENT ROADS.** BINDER "C" is slightly harder than BINDER "B" and is used in sections subjected to long continued heat.

Standard Asphalt Road Oils

STANDARD ASPHALT ROAD OILS are made with varying percentages of asphalt, from the lightest, containing 30 per cent asphalt, to the heaviest, containing 60 per cent. asphalt. Used under all conditions necessitating freedom from dust and protection of surface.

A full description of our various products, together with specifications for their correct use, is given in our illustrated Booklet. This will be sent free upon request.

Standard Oil Company

Baltimore, Md.

(Incorporated in New Jersey)

ROAD OIL DEPARTMENT

Branch Offices:

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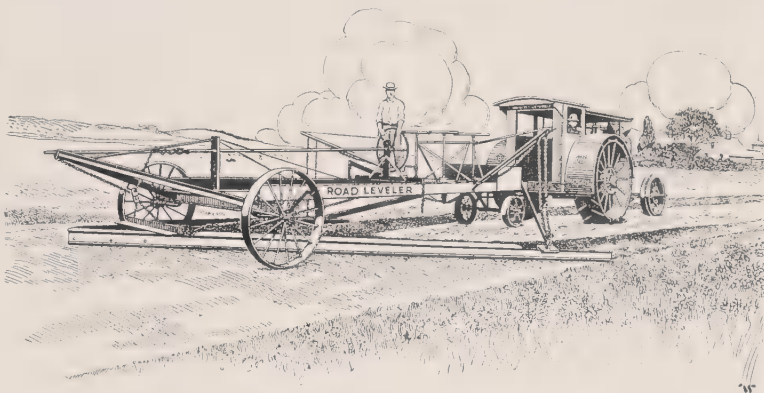
Norfolk, Va.

Charleston, W. Va.

Washington, D. C.

Best For Road Making

Many of the smoothest, best constructed roads in America were made with I H C Tractors. It has been thoroughly demonstrated in many official contests that these famous tractors do all kinds of drawbar and belt-power work at the lowest fuel cost. These advantages mean much to the contractor and road-builder—better work—less expense—considerable saving in time.



I H C Oil Tractors

Have great practical advantages over steam tractors. They require no expense for men and teams hauling coal and water. No danger from boiler explosion, no time lost in "firing up." And it won't be necessary to travel out of your way to avoid bridges that would be unsafe for a steam outfit.

I H C Tractors are built in 12, 15, 20, 25, 30, 45 and 60-horse powersizes, to operate on either low or high grade fuel oils. The I H C line also includes general purpose engines which operate on kerosene, gasoline, distillate, alcohol, or gas. Catalogues and complete information about this money saving line will be sent on request. Address your letter to

International Harvester Company of America

(Incorporated)

151 Harvester Building

CHICAGO U S A

The "PANAMA ROUND"

CAST IRON CULVERT PIPE

Fully Warranted

Has all the good features of any Iron Pipe, and a great many which no other make of pipe has.

THE "PANAMA ROUND"

Note the following points as shown on the cut:

The *double joint flange* where the half sections come together

The *lugs on end of pipe* for interlocking. Lugs on bell end do not show.

The *lugs on the side* for fastening the two half sections together.

The *general design* of the *ribs*.

INTERLOCKING AND SELF-SUPPORTING

A Few Reliable Southern Dealers Wanted

The Zieg Manufacturing Company

Fredericktown, Ohio

Manufacturers of The Panama Line of Road Graders, Road Drags and Cast Iron Culvert Pipe

Tarvia
Preserves Roads
Prevents Dust



Broadway, Norwich, Conn., Treated with "Tarvia B."

A Dustless Thoroughfare

"**TARVIA B**" is a tar product which is liquid at normal temperatures and can be applied to the surface of a macadam road from a modified sprinkling cart, no other apparatus being necessary.

The usual procedure is to sweep the road of surface dust and dirt, apply the Tarvia B and keep the traffic away for a few hours until the Tarvia has penetrated into the road surface. This grade of Tarvia is used only on roads where the rolling effect of traffic has made the interstices between the stone very small; on this account a denser grade of bitumen would not do, because it could not percolate into so closely bonded a surface. Tarvia B, however, finds its way into such surfaces and forms a matrix, holding the fine screenings in position, preventing raveling and erosion, preventing the formation of dust by automobile traffic and greatly prolonging the life of the roadway.

A typical instance of the use of Tarvia B is in Norwich, Conn., Mr. E. C. Lillibridge, the Street Commissioner there, wrote as follows:

November, 15, 1912

"You ask for my opinion concerning Tarvia B to which I will say I do not believe it has any equal. We have used this material for three years and the more it is used, the better satisfaction it gives, as to preserving the road and lasting longer. We have the last year used this material on two miles of streets and today those streets are in excellent condition after the traffic of heavy teams and autos."

In addition to Tarvia B there is Tarvia A for hot surface application and Tarvia X for road construction.

Booklets sent free on request.

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SOUTHERN GOOD ROADS

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Lexington, N. C., March, 1913

Entered at Lexington Post Office as
second class matter

Andrew Jackson Memorial Highway Association

By MISS ALMA RITTENBERRY

Chairman of the Andrew Jackson Memorial Highway Committee of the Alabama Daughters of 1812

IN submitting the second annual report of the Jackson Highway work we shall have to ask you to excuse us for not rendering it when due at the last regular meeting of the Board of Directors.



MISS ALMA RITTENBERRY

Miss Rittenberry is Chairman of the Andrew Jackson Memorial Highway Committee of the Alabama Daughters of 1812, and has done fine work for the Highway all along the line from the Lake to the Gulf. She is one of the Southern Good Roads' representatives in the southern field and a very valuable one.

When the report of October 30, 1911 was submitted it was most gratifying that so much sentiment and enthusiasm had been created in behalf of the Jackson Highway that the same chairman was re-appointed to

serve until the work was completed, or rather until the president's term of office expired. By that time we hoped to have the highway built, or the sentiment in its favor so crystalized that the building of this memorial to Andrew Jackson would be one of the instances where there could be "No such word as fail."

The second year's work has been continued on the same line as that of the first with the exception that it has been carried on with the expenditure of much more time and personal expense on the part of the chairman. This second year's work was started with only fifteen dollars in the treasury. Ten dollars since has been sent by the Daughters of New York and five dollars by the Daughters of Texas to the president and by her turned over to the chairman. As the work of the Jackson Highway committee is purely educational for the purpose of creating sentiment—the money has been spent for postage, stationery, telegrams, night letters, typewriting and other expenses necessary to carry on this educational work.

Your chairman was invited to attend the meeting of the Illinois Woman's Good Roads Association, which held its first session in the Auditorium Hotel, Chicago, April 3-4, to tell of the work of the Jackson Highway, but an empty treasury prevented her from going. She was also extended the courtesy of an invitation to the Good Roads Congress which met June 19th in Baltimore but was deterred from attending by the same thing that kept her from Chicago, but Mrs. Walter W. Watt, President Daughters of 1912, North Carolina represented the chairman in Baltimore in the following beautiful words: "Ladies and gentlemen: In behalf of the Jackson highway committee, in my own behalf as state president, and in behalf of the North Carolina Daughters of 1812, as well as in behalf of the patriotic citizenship of North Carolina, the birth-place of Andrew Jackson, I file my earnest plea for the great, practical and useful monument, in the form of a public highway from lake to gulf, which was launched under the auspices of the Alabama Daughters of 1812, in a great utility to honor a great utilitarian, a pulsating, life-given thoroughfare, devoted to the needs and pleasure of those whose prosperity and happiness were largely made possible by the tenacity of purpose and temerity of patriotism of this great North Carolinian. Call it the Jackson Highway, build it better than Appius Claudius built the Appian Way, and as near as possible along the routes of the doughty old warrior's military roads, and a monument will have been built

to General Andrew Jackson, patriot, soldier and statesman, that will survive longer than the Coliseum of ancient Rome, and reflect honor for the pride of posterity."

Hon. Victor O. Atkins, member of Alabama Highway Commission, and Hon. Key Milner, Vice-President of Alabama Good Roads Association and Commissioner for Clarke county, wrote to your chairman, inviting her to attend the Mobile and Selma Midsummer Good Roads meeting on the 24th of July at Pine Hill, Alabama, and tell of the work of the National Society United States Daughters of 1812, state of Alabama, on Jackson Highway. This was a distinct recognition of the work of the Alabama Daughters of 1812 and a



MISS KATE MCCLURE KELLY

Miss Kelly is State President of the Alabama Daughters of 1812 and a very brilliant young woman. She is the only woman lawyer practicing in the courts of Alabama. She is deeply interested in the Jackson Memorial Highway.

compliment to the chairman, and without one penny in the treasury the chairman accepted the invitation. As a child in Tennessee, the state where Andrew Jackson lived and died, this chairman had often heard when one was speaking of a person that had not the wherewithal with which to pay his traveling expenses, this homely saying, "He took his foot in his hand and went over the hill." So she picked up Southern Good Roads Magazine and went over the entire proposed route of the Jackson Highway.

Mr. H. B. Varner, the editor of Southern Good Roads, had given much space and encouragement to the Jackson Highway, so the chairman felt that in taking up the magazine and soliciting orders at one dollar per

year in thus "working the road" she was also working her way over the route of the Jackson Highway and while doing this the work of the Jackson Highway was thoroughly explained. As a result, a good road advocate was gained and the money gotten to pay the expenses of the chairman.

At Pine Hill the chairman told of the work to some three thousand people assembled, two-thirds of whom were women. At Mobile Hon. John Craft and Hon. J. D. Block called a meeting of the Directors of the Board of Trade. The chairman read Mrs. Watt's speech. An invitation was extended to the chairman to visit Mobile in November. At New Orleans the chairman was invited by Mr. Trezevant, Secretary of the Progressive Union to attend a factory luncheon, and was given the privilege of the floor, dividing honors with some prominent speakers. A trip to Nashville was made by way of Vicksburg and Memphis. These two cities are not on the route of the Jackson Highway, but much interest was taken in our work. Just here wish to say that we are much indebted to Mr. Lee Richardson of Vicksburg who sent his automobile around to the hotel where the chairman was stopping, placing it at her disposal for going through the National Park, which she did. At Nashville the Ladies' Hermitage Association had appointed Mrs. Willis J. Hilzing chairman for Tennessee, and through her your chairman was invited to go before the Board of Directors of the Association and explain our work. The directors pledged their moral support.

Your chairman worked her way on down through Franklin, Columbia and Pulaski, Tennessee, to Athens and Decatur, Alabama, and met with cordial support and endorsement of the work.

On the night of September the 15th she left Birmingham for Chicago, the northern terminus of the Jackson Highway and Bowling Green, Kentucky, was reached on the morning of the 16th. The trip through Kentucky was a pastoral delight as well as a successful one in the interest of the Jackson Highway. Kentucky is beautiful in September. Stops were made at the towns and villages along the old Louisville and Nashville Turnpike. At each place the visit and object was heralded ahead. Visits were made to Smith Grove, Cave City, Horse Cave, Munfordsville Elizabethtown and Louisville. On leaving Louisville, the chairman was invited to attend the Auto Salesmen's Convention by one of the publicity men, and was given the privilege of the floor. Our work was there endorsed. A Cole car was placed at the disposal of the chairman and two of the Indiana Daughters of 1812. We took in the city and the Speedway. The courtesy was extended by Mr. McKee, Advertising Manager of the Cole Car Company, Indianapolis. There is no concerted action among the Daughters of 1812 of Indiana in regard to the work of the Jackson Highway, but there is among prominent good roads men a sentiment in behalf of a North and South Road with the assertion that the name, "Jackson Highway," was most appropriate. An invitation was extended to meet with the Daughters of 1812 of Illinois at their October Board Meeting, which was held at the La Salle Hotel, but owing to the lateness of the hour, and a previous engagement the meeting did not materialize. Illinois has two state Good Roads Associations. A Woman's Good Road Association with many prominent club women as members and Chicago is the headquarters for the National Good Roads Association. They have taken up as their work the Lincoln Highway, but that does not in the least interfere with the work of the Jackson Highway. Hon.

Carter Harrison, Mayor of Chicago, is on the committee of the Daughters of 1812, and has enthusiastically endorsed the North and South Highway.

Your chairman went over the highway between Birmingham and Montgomery last and found that it is not as dead as many would have it. Shelby county is rapidly filling in the space connecting with Jefferson county, which for some cause has failed to build its four miles promised. Chilton county is building and East and West highway. The North and South will follow. Through the courtesy of Mrs. Michelson of Thorsby, the chairman met with twenty of Thorsby's progressive women workers. All were enthusiastic for the Jackson Highway. Several jokes were told about the town being decorated especially for the Daughters of 1812. "J. H." in big letters, made of white carnations, welcomed the Ledger Scouting party, last year.



MRS. WALTER W. WATT

Mrs. Watt is President of the North Carolina Daughters of 1812 and lives in Charlotte. She is one of the social leaders of her city and is prominent in D. A. R. and U. D. C. circles. She was spokesman for the Jackson Memorial Highway at the big Good Roads Congress that met in Baltimore, June 19, 1912.

The Daughters of 1812 were not included in the Ledger's invitation list to the reception at Thorsby Inn.

The citizens of Clanton and Verbena want and are willing to help build the Jackson Highway. Montgomery county has beautiful roads. The chairman is much indebted to Hon. Thos. M. Owen for many courtesies shown her while in the city of Montgomery, and also to the county engineer, Mr. Stukenburg, for an automobile ride over some of Montgomery's beautiful roads.

That a Lakes to the Gulf Highway is a most impor-

tant one, history and statistics prove. The trend of trade and commerce in the United States is North and South. That the name of this north and south highway should be "Jackson Highway," and that it should connect Chicago with New Orleans, splitting the Middle Basin, coming down through the states of Illinois, Indiana, Kentucky, Tennessee, Alabama, Mississippi and Louisiana as the most feasible route, is conceded.

On the 7th of August a tri-state good roads meeting was held at Huntsville, Alabama. Mr. Price, editor of the Nashville Democrat, was the leading spirit. A sociability run was made from Nashville. This route was from Nashville by way of Murfreesboro-Fayetteville to Huntsville with a general discussion that in selecting a route for tourists that it be continued to Chattanooga, Atlanta and on to Jacksonville. This tri-state meeting did not endorse the work of the Alabama Daughters. Another tri-state meeting was held on the 4-5 of October at Mammoth Cave, where a Lakes to the Gulf association was formed. The route of this association's highway has not been practically defined. The secretary, Mr. H. L. Ramsey, of the Lakes to the Gulf Association, in an article in the Louisville Times of November 16th, prints a map showing the routes of the eight national highways proposed in congress, and calls attention to the fact that Louisville was left off of the line of the proposed highway. It is astonishing to the chairman that a man of Mr. Ramsey's ability and seeming fairness would ignore and try to discredit a patriotic organization like the National Society United States Daughters of 1812, especially when the chairman showed him the articles printed in the Birmingham Age-Herald of September 3 and 10, 1911, and editorials in the Mobile Register of July 13, 1911, calling attention to the fact that not one of the eight National Highways was named for Andrew Jackson, a man whose name is identified with more roads and trails than any other in American history, nor was one proposed to connect the lakes with the gulf, coming through the cities of Louisville, Nashville, Decatur, Birmingham, Montgomery, Mobile and New Orleans, as the Alabama Daughters of 1812, have in their monument to Andrew Jackson.

The Jackson Highway was planned and launched by the Daughters of 1812 of Alabama as a National Highway, and more work in an educational way has been done for this highway than any proposed, with the exception of the highway planned by the New York Herald and Atlanta Journal from New York to Jacksonville, Florida.

In an article published in the Birmingham Age-Herald of September 3, 1911 your chairman suggested that federal aid be asked to construct a Memorial Bridge to Andrew Jackson across the Tennessee River at Decatur, Alabama, a bridge that will meet the requirements of all traffic, and requested Miss Maude McClure Kelley, President of the Daughters of 1812 of Alabama, to draw up a bill to be presented to congress. The bill as drawn by her is here appended.

AN ACT TO PROVIDE FOR THE ERECTION OF A BRIDGE ACROSS THE TENNESSEE RIVER AT DECATUR, ALA.

Be it enacted, etc.:

That five hundred thousand (\$500,000) dollars is hereby appropriated, out of any money in the treasury not otherwise appropriated, for the erection of a memorial bridge across the Tennessee river at Decatur, Alabama as a monument to Andrew Jackson the same to be approved by and under the direction of the Chief Engineer of the war department.

Last spring your chairman wrote to President Hoop-

er of the American Automobile Association asking him to send one of their tours over the Jackson Highway. Mr. Hooper replied that at that time they had not decided on the route of the tours, but cordially expressed his sincere wishes for the success of the Jackson Highway, and suggested that the daughters of 1812 fall in line with the American Automobile Association in its effort to get state and federal aid for the construction of highway and roads.

In conclusion will say that every dollar of the Chairman's expense over the Jackson Highway, a distance of over 1200 miles, was met by her individually, with the exception of five dollars contributed by the Southern Bitulithic Company, and two parties not caring for the magazine insisted on giving to the cause one dollar and fifty cents. Mr. H. B. Varner gave \$17.50 besides

tured, refined, patriotic women, we feel that this monument to Andrew Jackson, "The Jackson Highway," will soon be a vitalized reality.

The American Highway Association Pledged to Federal Aid.

Formal approval of the policy of federal co-operation with the states in highway construction and maintenance characterized the annual meeting of the Board of Directors of the American Highway Association held in Washington last month. The decision of the association is of vital importance to every one interested in the improvement of its public roads.

Until the present time the American Highway Association has not through its board taken a definite stand in the matter of federal aid except by resolution at the annual road congress in which it pledged its association to the Congressional Joint Committee. Its efforts have been confined principally to educational and advisory work in all the states, aiding in the formation of road improvement associations in the various states and municipalities and assisting in the drafting of uniform laws for highway building, maintenance and supervision.

An invitation to confer with the joint committee of congress investigating the subject of federal aid with a view to determining whether or not such a system would be practicable and, if so, what form the federal aid should take, undoubtedly led the board of directors of the American Highway Association to take a definite stand in the matter, and immediately following the meeting of the board the members conferred with Senator Bourne of Oregon, Chairman of the Joint Congressional Committee, and his fellow members of that committee, in response to the invitation extended some time ago.

The members of the board of directors who were present at the annual meeting were: Logan Waller Page, President of the association, who is also director of the United States Office of Public Roads; W. W. Finley, president of the Southern Railway, who is Chairman of the association's executive committee; Alfred Noble, the eminent Past President of the American Society of civil engineers; J. M. Goodell, former editor of Engineering Record; George C. Diehl, chairman of the Good Roads Board of the American Automobile Association; A. G. Batchelder, Chairman of the Executive Committee of the American Automobile Association; George W. Cooley, State Highway Engineer of Minnesota; J. P. Nelson, representing the C. & O. Railway Company; Jesse Taylor, president, Ohio Good Roads Federation, and A. H. Huston of Columbus, Ohio. The consensus of their opinion was that there should be federal co-operation in highway construction and that the best results could be obtained by improving those main highways which carry the greatest volume of tonnage and serve the largest number of people with an equitable distribution of such highway improvement among the states. At the two hour conference with the joint congressional committee the views of prominent members of the board of directors of the association were made known and will probably have much influence on the final judgment of congress.

The members of the board of directors passed a resolution confirming the action of President Page in approving the employment of J. E. Pennybacker, Secretary of the association, as statistician of the congressional joint committee, and expressing appreciation of the honor done the association in this appointment.

Newton county, Arkansas, will spend \$25,970 in the construction of two steel bridges.



MRS. FREDRICA MICHELSON

Mrs. Michelson is one of the leading women of Thorsby, Alabama, a little town on the right-of-way of the Andrew Jackson Highway. She is a member of the Andrew Jackson Highway Committee of the Alabama Daughters of 1812 and an enthusiastic worker.

a generous per cent of the subscription price of Southern Good Roads. Many prominent newspaper along the route sent a reporter to the hotel to interview the chairman, and the notices given the work have been preserved and filed.

It is especially gratifying that our National President, Mrs. William Gerry Slade and the National Executive Board have been so impressed with the work of your committee that they wish to take it up as a national work, and when we consider what the Daughters of 1812 of Alabama have accomplished in asking for and being given "the right of way" by prominent men in authority, and in creating sentiment along the entire route for the Jackson Highway with the proffered aid and support of the National Society United Daughters of 1812, composed of several thousand cul-

"Boone Way"---On to Cumberland Gap

By MR. JAMES MARET,
Mt. Vernon, Kentucky

"BOONE WAY" is the name suggested for a proposed national highway between Cumberland Gap and Crab Orchard, Ky., a distance of 98 miles. The originators of the present movement (members of Mt. Vernon Commercial Club and the "Boone Way Booster Band" of Mt. Vernon, Ky.) will have Representative Harvey Helm, of the Eighth Kentucky District, introduce a bill at the extra session of Congress in April.



Daniel Boone

This picture of the famous frontiersman appears on frontispiece to Colonel Roosevelt's "Winning of the West," Vol. 2. The facsimile signature is taken from a marriage certificate in the office of the clerk of the superior court of Rowan county, N. C.

asking for an appropriation of a sufficient amount of funds to pay for the construction of the proposed highway. Any objection offered by congressmen not directly interested in the movement it is thought may be overcome, on account of the historic and interstate features of the undertaking, if properly presented.

The route over which Boone Way would be constructed follows the "trail" over which that famous

and venerated frontiersman, the great Daniel Boone, came, after entering the "dark and bloody ground" at Cumberland Gap, (which was made famous during the war between the states) and over what is generally known as the Old Wilderness Turnpike. But why it was ever called a "turnpike" is beyond our ken, as there probably was never a half mile of macadam put on the whole route. The proposed highway would, if the plans of those back of it

carry, start out from Middlesboro, there being already built one of the finest highways south of the Ohio between Cumberland Gap and Middlesboro; thence through Pineville, Barbourville, Corbin, London, Livingston, Pine Hill, Mt. Vernon, Brodhead, to Crab Orchard, where connection can be made with Kentucky's fine system of turnpikes.

"Boone Way" would, in addition to being an enduring monument to that intrepid frontiersman who left the Yadkin Valley in North Carolina and made a "trail" far into the wilderness of Kentucky, confer vast benefits upon hundreds of thousands of people along its line, and those living to the north and southeast of us who would use this "connecting link" in passing between the north and southeastern portions of our country. The time is near at hand when the people will ask congress to switch at least a portion of the appropriated millions from harbor improvements, lock and damming rivers, etc., to the purposes of highway construction. During the past three or four years a marked advance in that direction has developed in public sentiment. As a matter of justice, we see no reason why all government appropriations for travel routes should go to the waterways and nothing to the highways. It does seem that the land lubber is entitled to some of the benefits from appropriations made with a munificent hand by the government. The burdens and benefits have not been equalized between the people. For instance, \$154,301, of Kentucky revenues was used last year towards paying the municipal expenses of the city of Washington; for schools, streets, sewers, watermains, police, improvements and repairs, salaries and health, interest on sinking fund, lighting, fire department, etc. If this sum should be diverted to Boone Way for three years, the work of construction could be done and paid for. Tennessee, Virginia, North Carolina, and all the other states pay their proportion of these yearly donations of millions for the support of the Washington City municipality.

The system of campaign adopted by the "Boone Way Boosters Band" reaches out to all states where Kentuckians are found, to whom literature on the project is furnished, advising and requesting them to get into communication with the congressmen of their adopted state and get them interested in our move. Kentuckians are hustlers wherever found. Our Band also gets its literature to all native Kentuckians who

are now representatives in congress from other states as well as to governors, judges, and on down to justices of the peace, constables, and private citizens, native Kentuckians now living in other states. All are appealed to as true Kentuckians and requested to remember the place of their nativity and to work for Boone Way. Our various Kentucky Clubs, working

thing that is proper and right to have this important highway built, which would be of such benefit to Kentucky, Tennessee, Virginia and North Carolina. If properly presented, I believe congress will act promptly in furnishing aid."

The governor has sent a personal letter to the seven governors of our bordering states, requesting them to use their good offices in furthering the movement of "On to Cumberland Gap."

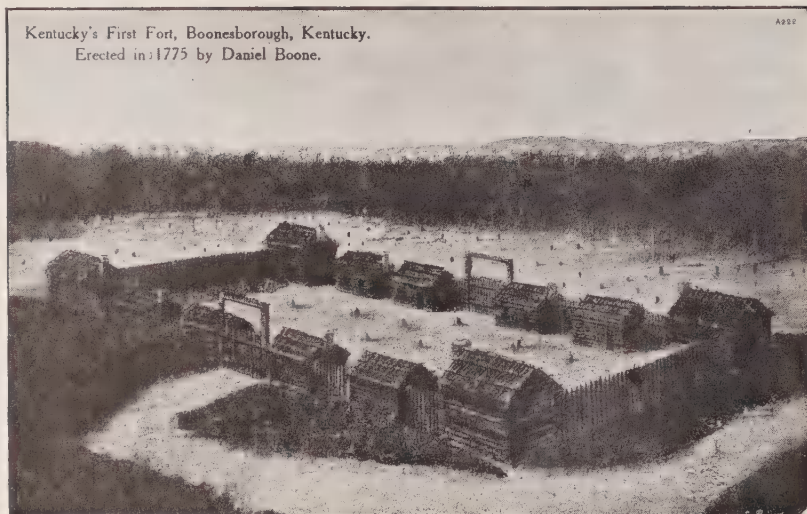
Boone Way would prove the greatest and most generally used automobile route between the north and southeast.

The only possible drawback to its establishment, that we have heard, was voiced by "Jar Head" Thompson, an old Rockcastle county resident, when he remarked that he feared many good corn crops would fail to materialize on account of the tillers of the soil along the route putting in their time roosting on fences viewing the procession of innumerable passing automobiles.

The people of North Carolina should take an active interest in the building of this memorial highway for it was in North Carolina that Boone lived many years. His parents moved to North Carolina from Pennsylvania in 1750 and settled on the banks of the Yadkin River in what was then a howling wilderness. At a spot on the Yadkin River in what is

now Davidson county, the Boones erected their humble cabin. Up to about 25 years ago part of this old cabin was still standing but relie hunters chopped the old logs into pieces and carried them away. The Daniel Boone Memorial Association, organized by Hon. J. R. McCrary, of Lexington, N. C., raised funds to build upon the old site a cabin exactly like the old and in it are preserved many very valuable Boone relics.

Daniel Boone rendered great service to the state of



Kentucky's First Fort, Boonesborough, Kentucky.
Erected in 1775 by Daniel Boone.

Boonesborough Fort, the first stronghold of the white man in Kentucky
built by Daniel Boone and the early settlers

along these lines, are reaching hundreds, most of whom are becoming enthusiastic boosters. Virginia is organizing and we have good news from Tennessee. Our band appeals to North Carolina, to organize and work after these plans. The inter-state interests connected with the proposed highway is our reason for asking these states active aid and support.

Our people are enthusiastic and hopeful of securing what we started out after. We have many strong and flattering endorsements from congressmen, governors, judges, and many leading and influential men. Hon. Champ Clark, speaker of the house, in writing to the president of our Boone way boosters band No. 1, at Mt. Vernon, says: "I have your letter of the 1st instant and will be glad to confer with Mr. Helm (Representative, Eighth Kentucky District) about the bill, and I can assure you now that I look upon the matter with a very favorable eye." Senator-elect Ollie M. James, of Kentucky, says: "I shall be glad to co-operate with Congressmen Helm, Cantrill and Sherley, and others, in the matter you write about." Hon. A. O. Stanley, of Kentucky, says: "I have been, and am, in favor of the building of good roads, believe that the federal government should, in so far as it has a constitutional warrant, aid in every way in this laudable cause." Hon. J. C. Cantrill, 7th Kentucky District, writes: "You can count on me to stand by you in this project. The Cumberland Gap road will be of great mutual benefit to the mountains and the blue grass sections." Gov. James B. McCreary, of Kentucky, advises: "I am very decidedly with you in your effort to secure a highway between the Ohio river, through southeastern Kentucky, to Tennessee, Virginia and North Carolina, and I am ready to do any-



Boone Memorial Cabin erected on the site of the original Boone Cabin on the banks of
the Yadkin River in Davidson County, North Carolina

his adoption. Tirelessly and fearlessly, he pushed into the wilderness and opened up new territory to the white man. When settlers began to come into his community he moved on up the Yadkin River and in what is now Wilkes county he established another home. Later he passed over the Blue Ridge into what is now Ashe coun-

ty. It is related that there is a long stone in an old grave yard on the banks of the New River that Boone selected to go at the head of his grave, but fate willed that he should die elsewhere and he pushed on, a member of that intrepid little band of pioneers that formed

power to help build a monument to the great frontiersman that will perpetuate for all time his remarkable services to the state and to the advancement of civil-



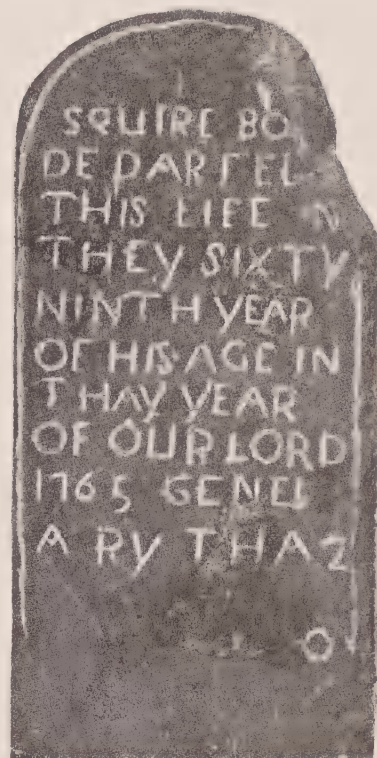
Handsone monument in Frankfort, Kentucky, erected by the state of Kentucky. He and his wife died at Charette, Missouri, and were buried there, but in 1845 their bones were disinterred and removed to Frankfort

the vanguard of Anglo-Saxon civilization, until they reached the heart of the "Dark and Bloody Ground," fair Kentucky.

Squire Boone, Daniel's father, and other members of his family, lie in North Carolina soil. They are buried in the old Joppa graveyard near Mocksville, N. C.

At Frankfort, Kentucky, a handsome monument marks the graves of Daniel Boone and his wife, Rebecca Bryan Boone, who was a North Carolina woman of fine family connections.

Surely, the Good Old North State will do all in her



This is a cut of the grave-stone that marks the last resting place of Squire Boone, father of Daniel Boone. Relic hunters defaced the stone, as shown in the picture, but it is now protected by a steel cage. It may be seen at the old Joppa grave-yard near Mocksville, North Carolina

zation. Kentucky acclaims him "The Father of Kentucky," and North Carolina may well be proud of the son who laid in the wilderness the foundations of such a commonwealth.

Nearly \$1,500,000 was spent in Harris county, Texas, during 1912 on motor vehicles, according to an estimate made from records in the county clerk's office. Nearly 900 licenses were issued during the year to automobile and motor cycle owners, bringing the total number of motor vehicles in the county up to 3,200.

Waco, Texas, is laying 3,000 square yards of paving.

Prizes For Photographs of Good and Bad Roads

Southern Good Roads magazine will each month, beginning May 1st, 1913, award two prizes as follows:

1st, \$2.50 to be awarded for the best photograph of a good country road. 2nd, \$2.50 to be awarded for the best photograph of a bad country road, suitable for publication in Southern Good Roads. The idea is to show the best and the worst.

All photographs submitted must be sent flat (not rolled) and no photographs will be returned. They should be legibly marked on the back of the photograph, the title, location and the name and address of the sender. Preference will always be given to photographs reproducing beautiful scenes. The two prize

winners will be published in Southern Good Roads each month.

Get busy with your kodak or camera and win these prizes. Address:

SOUTHERN GOOD ROADS,
Lexington, N. C.

The city of Louisville, Kentucky, is asking for bids on street work as follows: 6740 square yards of concrete; 18,000 square yards of wood block paving; 47,000 square yards of asphalt and 46,000 square yards of vitrified blocks sidewalks. The whole will cost about \$263,000.

Quebec-Miama International Highway

By HOWARD D. HADLEY

Plattsburg, N. Y., President of the Quebec-Miama International Highway Association

THE International Highway now being built connecting the city of Quebec, Canada, with the city of Miami, Florida, will be entirely completed before it comes time to throw away your 1914 calendar, provided only that the people of one or two southern states get to work promptly with the same energy and enthusiasm that has characterized the work in the remaining nine or ten states through which the great road leads.

We have had no federal aid for this important enterprise, either in this country or in Canada, although the highway will be approximately 2,500 miles in length. It leads through many of the largest and most important cities in North America, including Montreal, Albany, Troy, New York, Trenton, Philadelphia, Baltimore, Washington, Richmond, Raleigh, Columbia, Augusta, Savannah and Jacksonville.

Starting near the famous Everglades of Florida, it leads through orange groves of the Peninsula state, crosses Suwanee river, famed in song and story, through the region where Sherman marched to the sea, through the peach orchards and watermelon patches of Georgia.



This fine white stretch of roadway is in Dade county, Florida, near Miama, and is built of ceraline limestone

through the cotton fields and tobacco plantations of the Carolinas and Virginia, passing scores of battlefields made famous in the Revolution, the war of 1812 and the civil war; the "Wilderness," Manassas, Chancellorsville, Bull Run, Dumfries, Fredericksburgh, Spottsylvania, Hanover, Gaines' Mill, Seven Pines, Fair Oaks, Malvern Hill, Petersburg and Appomattox, on through the District of Columbia over the road on which George Washington took his last ride; through Maryland, the home of the Chesapeake Bay oyster, the canvas-back duck and the diamond-back terrapin, described recently as the gastronomic center of America; through Pennsylvania and New Jersey; up the historic Hudson, noted, among other things as being navigable for a greater proportion of its total length than any other important river in the world; through Saratoga Springs, once a famous watering place and destined in the future to be still more famous in this regard; past lovely Lake George, skirting the eastern slope of the

Adirondaacks, on along the shores of Lake Champlain, Ticonderoga, Crown Point, Ausable Chasm, Plattsburgh, the scene of the last naval battle, (Sept. 14, 1814,) ever fought between English-speaking peoples, then into Canada, crossing the majestic St. Lawrence by means of the famous Victoria Bridge and finally along the north shore of this magnificent stream to quaint old Quebec, one of the most interesting, and rapidly becoming one of the most beautiful, and one of the busiest cities in North America.

Travellers will come from the ends of the earth to ride over this great thoroughfare! Farmers with automobile trucks will market their produce over it. With other good roads it will in time bring the bicycle back into general use, and will, I hope, help to revive the almost forgotten pastime of touring the country afoot.

The year 1915 will be a memorable one in the history of the world for it will witness the opening of the Panama Canal to general traffic, and it will mark the celebration of the 100th anniversary of peace among English-speaking nations. In this country it will bring the completion of the colossal improvements now being made in the canal system of New York state, connecting the Great Lakes and the St. Lawrence with the Hudson, as well as very great improvements to our inland waterways in all parts of the United States.

The building of this Quebec-Miami International Highway from Florida to Canada goes hand in hand with that other great project for the industrial improvement of the Atlantic coast states—I refer to the Atlantic Deeper Waterways project which is now an assured success.

The year 1915 will also mark the passing of a half century of Peace between the north and the south. If in 1860 there had been automobiles and roads from the Canadian line to the Gulf of Mexico like this Quebec-Miami road, we should have understood each other better and the civil war would have been impossible.

Along with the celebration of a century of peace among English-speaking peoples, let there be a celebration of a half century of peace between the north and the south in 1915, a joint celebration if you please! Let us ask all the nations of the world to join in celebrating these events! Let there be very little talk of who won and who lost, but rather of the courage and fortitude of those on both sides who fought and bled and died for what they felt was right! Let the year 1915 mark the turning point in all the nations of the world in the matter of war expenditures! Let us spend less and less for armies, navy, powder and the results of war and more and more for improved waterways, for public docks and terminal facilities, for education and for good roads! Why not?

Keep this in mind continually; as long as we spend 70 cents out of every dollar of national revenue for war, for the results of war or in preparation for war we will not have very much money to spend for good roads!

Why not get at this now? I cordially agree with the man who said he'd rather ride a mile over a good road while he was alive, than to be hauled a million miles over a good road after he was dead!

In New York state preparations are under way for



This Does Not Look Like a Road, But it is. At least, it Passes For One. It is Near Clayton, Georgia, and Affords a Striking Example of What Will Happen to a Road That is Not Properly Drained

marking the main trunk highways of the state with a distinctive color. The idea is a good one, but would it not be well for each state to wait a little while and see if we cannot get joint action by all the states on interstate and international highways like this Quebec-Miami International Highway? I think this great International Highway now nearing completion and this proposed Ocean to Ocean Highway and all these great trunk lines crossing several states should have a method of marking and that the mark should be the same in all the states through which each one leads.

The Quebec-Miami International Highway will soon be completed. Some of the links in the Atlantic Deeper Waterways systems will soon be finished. What are the states directly affected, the thirteen original states, doing in preparation for the era of prosperity which these projects and the Panama Canal will surely bring? Are you organizing co-operative associations among your farmers to aid in harvesting, grading, packing, shipping and marketing the produce of the farms and orchards? Are you watching to see that the water power resources of your state do not fall into the clutches of a water power trust? Do you fully realize that the three R's of Transportation, i. e., Road, Rail and River, should be connected by public terminal facilities of the highest efficiency, and that much sound constructive legislation is needed to bring about the free and harmonious development of these three great agencies?

Up in the Adirondacks scheming politicians and greedy corporations are planning a water power trust, and this is typical of what is going on all over this

country, up in Alaska and in Canada. This sort of thing should be stopped! The natural resources of every region should be developed for the benefit of all the people of the region and not for a privileged few!

We here in America, as has been well said, hold in our hands the hope of the world, the fate of the coming years, and shame and disgrace will be ours, if in our eyes the light of high resolve is dimmed—if we trail in the dust the golden hopes of men!

An effort to obtain the passage of a bill appropriating money to build a Lincoln memorial road from Chicago to Springfield to St. Louis will be made by the Illinois Good Roads association at the present session of the Illinois legislature. A resolution to this effect was adopted at a meeting at the Auditorium hotel, Chicago, recently. The proposed ocean to ocean highway was also endorsed.

Mr. C. A. Crane, M. Am. Soc. C. E., Secretary, The General Contractors' Association, New York City, on February 24th delivered an illustrated lecture on "Proposals, Contracts and bonds from the Standpoint of the Contractor," before the Graduate Students in Highway Engineering at Columbia University.

Trigg county, Kentucky, elects to stay in the mud. This county defeated a bond issue of \$150,000 last month.

Opelika, Alabama, will build 20,000 square yards of concrete sidewalks.

Work of Exhibits and Road Improvement Trains in 1912

During 1912, according to the report of the United States Office of Public Roads, the office has continued to illustrate the best methods of road making by means of exhibits at expositions and state fairs and on road-improvement trains. These exhibits consist of models and enlarged photographs illustrating the various types of roads and road-building equipment, culverts, and bridges. The models illustrate the construction of earth, sand-clay, gravel, macadam, brick, bituminous macadam, concrete, asphalt, and other standard types of improved roads. The exhibits include models of quarries with miniature crushing plants in actual operation, road scrapers, steam rollers, split-log drags, and other forms of road-building machines and equipment.

The models are built to exact scale and show every important step in the construction of the various types of roads and bridges. These displays have already done much throughout the country to stimulate road improvement and to standardize methods of construction.

During the year the Office of Public Roads, co-operated with the Southern Railway, the Atlantic Coast Line, the Nashville, Chattanooga & St. Louis Railroad, the Norfolk & Western, and the St. Louis & San Francisco Railroad in the operation of road-improvement trains. These trains usually consisted of one passenger coach in which the road, bridge, and mechanical models and photographic enlargements were installed; one passenger coach for stereopticon lectures; one passenger coach in which a gasoline engine was installed for operating the mechanical models, lights for the stereopticon, and lights and fans for the train; and one officers' car for the accommodation of the representatives of the office and the railroad company. The cars and their transportation were furnished by the railroad companies, while the office furnished the exhibits and one lecturer and one demonstrator for each train.

The tour of the Southern Railroad's road-improvement train started on May 1, 1911, and was completed on October 29, 1911. The train traveled 13,481 miles in the states of Alabama, Florida, Georgia, Mississippi, North Carolina, South Carolina, Tennessee, and Virginia, visited 210 counties, and stopped at 251 towns, where 288 lectures were delivered to 46,733 persons.

The Nashville, Chattanooga & St. Louis road-improvement train started on October 9 and completed its itinerary on November 11, 1911. It stopped at 55 cities and towns in Alabama, Georgia, Kentucky, and Tennessee, and 75 lectures were delivered with a total attendance of 21,708.

The Atlantic Coast Line road-improvement train was started from Richmond, Va., on November 24, 1911, and completed its itinerary at Lake Butler, Fla., on February 22, 1912. During the trip 155 lectures were delivered by the office representatives to 22,000 persons.

The office also co-operated with the Norfolk & Western Railroad and the Missouri, Kansas & Texas Railroad Co. by furnishing a lecturer for their "better farming"

trains. The Norfolk & Western train started on December 6, 1911, and completed its work on December 14, 1911. Thirty-five lectures were delivered with a total attendance of 8,818. The Missouri, Kansas & Texas agricultural train started on January 24 and completed its itinerary on February 3, 1913. The office representative delivered 34 lectures with a total attendance of 25,810.

The St. Louis & San Francisco road-improvement train started on March 25, 1912, at Brownsville, Tex., and completed its itinerary at Morocco, Ind., on August 31, 1912. The "Frisco" itinerary included all of the principal towns on its lines in the states of Alabama, Arkansas, Illinois, Indiana, Kansas, Louisiana, Oklahoma, Tennessee, and Texas. In all 248 stops were made and 262 lectures were delivered by representatives of the office. The total attendance was 28,185.

In addition to the exhibits made on road-improvement trains, the office furnished exhibits of road and bridge models and road-building equipment to the state fair, Columbus, Ohio, from August 28 to September 21, 1911; the Industrial Exposition, Milwaukee, Wis., from September 2 to September 10, 1911; the North Dakota Industrial Exposition at Bismarck, N. Dak., from September 26 to October 16, 1911; the Alabama Good Roads Convention at Selma, Ala., in October, 1911; the Southern Texas fair, Beaumont, Tex., from November 27 to December 2, 1911; the Travel and Vacation Exposition, New York City, from May 23 to May 30, 1912; and the Intermountain Good Roads Association, Logan, Utah, from June 12 to June 15, 1912. The office furnished the War Department with an exhibit of bromide enlargements, illustrating road and bridge construction, for the Insular Fair held at San Juan, P. R., from December 7 to December 12, 1911. An exhibit of models and photographs of bituminous macadam roads, road machinery, and testing apparatus was also given at the International Exposition, Turin, Italy, from April 30 to October 31, 1911. Bromide enlargements were also furnished to lecturers for the Daughters of the American Revolution, the Mothers' Congress, and other organizations for lecture work, and to public schools, etc. In all cases the expense of transportation and drayage of these exhibits was paid by the association or exposition companies interested.

An interstate bridge company with a capital stock of \$30,000 was organized at Henrietta Texas at a meeting of good roads promoters for the purpose of building a model steel bridge across the Red River near the town of Charlie. This bridge will form the connecting link between the Texas and Oklahoma division of the Interstate Good Roads Association's highway.

Floyd county, Georgia, is considering a bond issue to build adequate bridges over rivers at Rome. The bridges now in place are not suitable for the traffic they must bear and will probably be taken down and moved to the country.

Hon. Curtis Hill, State Highway Engineer of Missouri on Federal Aid

Senator Jonathan Bourne, Jr., chairman of the congressional committee charged with the duty of collecting information as to highway systems of various states and nations, sent out a letter to the governors of the states, in which he asked, among other things, for a statement as to the attitude of each chief executive



HON. CURTIS HILL

tive toward federal aid. In Missouri Governor Hadley turned the letter over to Hon. Curtis Hill, state highway engineer, who answered it. As to federal aid Mr. Hill said:

In Europe nearly all countries give national aid to road work. In the United States road building was at one time thought to be a function of the government, and millions of dollars were spent by the national government upon roads. Since the civil war the national appropriation for roads has been confined to the District of Columbia, national cemeteries and parks, and in very recent years to foreign possessions. The original idea for government expenditure upon roads was the use of them for military purposes, but in recent times it is for their commercial and social value. Strong appeals are now being made upon congress to obtain national aid.

Our National Government assisted the railroads with money and large grants of land. Railroad transportation was necessary for the development of the country. Congress appropriates money for canals, rivers, and harbors. All of which is right—not one cent of it is regretted—but would it not be a fair proposition to directly assist the people as well as private corporations, and for those sections of the country receiving the direct benefit to assist in government aid for the improvement of those public roads which are utilized for rural free delivery, and which are largely used for the upbuilding of the great agricultural regions.

In view of the fact that our national government has given aid to the construction of railroads in a sum not less than \$14,000,000, and that in the distribution of the mails over star and rural routes is now using 241,000 miles of country road, constructed and maintained entirely by the counties and communities through which they run and without one cent of na-

tional aid, could the national government, in the exercise of its power to aid in internal improvements, expend money more wisely or beneficially than by an appropriation to be expended upon the roads of the several states under such proper restrictions and conditions as may be imposed.

If it is proper to spend millions of dollars of the nation's money on harbors which are used by relatively few, it is more proper and justifiable to spend some of the nation's money on public highways which are used by everybody.

If, also, it is proper and right for a county to aid the road district and for the state to aid the counties, it only follows that the national government should aid the states in road improvement. In my opinion, there are two methods under which the nation should aid the states, either in construction or in maintenance, and either one of which would be satisfactory. The maintenance feature of road work is a very important and too frequently a very neglected one. It would therefore seem only proper for the government to aid in the maintenance, leaving it to the state or county of that state to construct the roads. In fact, I think it would not be a bad plan for the automobile licenses of a state to be used under some equitable method for maintenance of an intercounty road system.

For this reason I am partial to the Shackleford bill, which was introduced and passed the lower House of congress in the session just adjourned. This bill provided for the payment of a certain rental by the na-



There are many roads and fords just like this in all parts of the south. This particular piece of bad road is near Abbeville, South Carolina

tional government for the use of roads over which the mail is delivered. The bill divided the road into certain classes and put a different rate of rental, depending upon the class of road over which the rural route went. These roads must be kept up to a certain standard before receiving the national prorata for maintenance. The rural route as a rule is carried over our most important and main traveled roads, and therefore this national money would be an aid for the maintenance of our main traveled roads.

In my opinion the national aid should be given either

er as above designated or else prorated among the states upon some equitable basis of distribution for construction purposes. This national aid received by the states should be expended only for the construction of permanent work, and only under either the direction or partial supervision of the state highway office. The supervision and construction should meet certain requirements provided for by the national government and be under the general supervision in the carrying out of these provisions of the United States Office of Public Roads. The state could then make such requirements in the general supervision of the state office as it may deem best to require of the local supervisors and road officials. I do not believe that national money should be appropriated directly to any one particular national road, but that any of the main traveled or intercounty system of roads in a state should have an equal opportunity for its prorata of the national aid, provided it meets with certain requirements. Our national roads would then be developed by a co-operation between the states for a continuous road. For example, if the national government appropriated money for the construction of the National Old Trails Road alone, other roads of importance and main traveled roads in the state of Missouri, for example, would be excluded from receiving any of the national aid whether or not they were ready to comply with conditions and requirements as the Old Trails Road. If the Old Trails Road was in a better position to comply with requirements for national aid than any other continuous length of road within Missouri, then it would be entitled to this aid more than any other main traveled road across the state.

The Interstate Bridge Co., capitalized at \$30,000, has been organized at Charlie, Texas, to build a bridge across the Red river at that town.

Good Roads Convention at Hopkinsville, Kentucky.

The town of Hopkinsville, Christian county, Kentucky, was the Mecca of the good roads enthusiasts of western Kentucky and northwestern Tennessee on February 19 and 20. Prominent among the speakers were:

Hon. Maurice O. Eldridge, U. S. Office of Public Roads, who delivered a great address on "Road Improvement."

Hon. R. C. Terrell, Commissioner of Public Roads, Frankfort, Ky., whose subject was "Road Law and its Application to Conditions in the State."

C. C. Gilbert, of Nashville, Tenn., secretary of the Memphis-Bristol Highway, who spoke on "Permanent Road Building."

Other speakers were: John Garner, Springfield, Tenn.; Charles Barker, Pembroke, Ky.; J. F. Grimes, Frankfort Ky.; W. T. Fowler, Judge Walter Knight and John C. Duffy, Hopkinsville, Ky.; D. H. Wenhardt, Bowling Green, Ky.; J. W. Sypert, Madisonville, Ky.

The last named speaker gave a demonstration of the King Split Log drag and delivered a practical, helpful address on the best way of working dirt roads.

Mr. R. E. Cooper, president of the Hopkinsville Business Men's Association, presided at the first day's meeting and Judge Walter Knight was presiding officer of the last day of the session. Messrs. T. L. and J. J. Metcalf entertained the delegates and business men of the town at a luncheon at Hotel Avalon and every courtesy was shown the visitors.

Washington county, Alabama, is preparing to build two bridges with concrete floors and State Highway Engineer W. S. Keller, is asking for bids for the same.

A Good Roads Association has been organized at Hillsboro, Texas. The association will draft a bill to be placed before the coming legislature to enable Hill county to issue about \$300,000 in bonds.



A Gravel Road Near Memphis, Tennessee. This Road Was Oiled With Asphaltoilene in July 1900. This Picture Was Taken a Year Later

Southern National Highway Association

The Southern National Highway Association was organized at Asheville February 12th. A convention was called for the purpose of deciding upon a route to be recommended to congress as a practicable line to connect with the San Diego-El Paso road, far enough south to permit of all-the-year travel between the Atlantic and Pacific Coasts, and it was at this convention, attended by delegates from every state through which the highway will pass, that the association was formed.

The convention attracted no little attention. Governor Locke Craig issued the call for it and the North Carolina legislature took official notice of the approaching meeting, February 4th, by adopting the following resolutions:

Whereas, it is proposed to establish a trans-continental highway from the Atlantic to the Pacific sufficiently far south to be used at all seasons, especially in the winter when the more northerly routes are blocked by snow, and

Whereas, the Central Highway of North Carolina from the Atlantic through Raleigh westward to the

4. That greetings be sent to the convention called by Governor Craig, to be held at Asheville February twelfth, for the purpose of forming a Southern Highway Association, expressing the hope that such an organization may be formed and federal aid secured to complete the southern highway.

That the resolutions of the Tar Heel assembly struck a responsive chord in at least one state is shown by assembly on February 10th, which are as follows:

the resolutions adopted by the Arkansas general assembly of response to the resolution of greetings of the general assembly of North Carolina as to the building of a Southern Trans-Continental Highway from the Atlantic to the Pacific.

Whereas, the general assembly of North Carolina did on February first, 1913, adopt a resolution sending greetings to the authorities of the state of Arkansas recounting that the Central Highway of North Carolina and the Memphis-to-Bristol Highway were nearing completion with but a short distance to build to connect the western terminus of the State Highway of North Carolina with the State Highway of Tennessee.



The Southern National Highway

Tennessee line is nearly completed and the Bristol and Memphis Highway in Tennessee is well advanced toward completion, and

Whereas, a free bridge costing six million dollars is now being built at Memphis which will carry this highway across the Mississippi, and

Whereas, a highway from Little Rock, Arkansas, to San Diego, California, is in daily use at the present time, and

Whereas, there remain but short gaps of road to improve in order to secure a direct and practical route from ocean to ocean;

Therefore, be it resolved by the senate, the house of Representatives concurring:

1. That the authorities of our own state be encouraged and urged to push the work on our central highway to a speedy completion.

2. That greetings be sent to the authorities of the state of Tennessee requesting the constructing of the short link necessary to connect the western end of the central highway of North Carolina with the Bristol to Memphis highway.

3. That greetings be sent to the authorities of the state of Arkansas requesting their co-operation in the speedy improvement of the highway between Memphis and Little Rock.

thus constituting one continuous highway from Memphis to the sea; and also recounting that a continuous highway from Little Rock, Arkansas to San Diego is in daily use at the present time; Therefore Be it Resolved,

(1) That greetings of response be sent to the assembly of North Carolina expressing our readiness to co-operate with North Carolina and all other states traversed by said route to the end that by united effort an ocean to ocean highway across the south may be constructed.

(2) That it is the sense of this legislature that means should be devised to hasten the completion of the main trunk line highways of our state from Memphis to Little Rock; from Little Rock to Fort Smith and from Little Rock through Hot Springs to Texarkana to connect with the great highway through Dallas, Texas, Roswell, New Mexico and Phoenix, Arizona, now in daily use for transcontinental travel.

(3) That greetings be sent to the Southern National Highway Convention to be held at Asheville, North Carolina, February twelfth for the purpose of forming a Southern Highway Association, expressing the hope that such an organization may be formed and federal aid secured to complete the southern highway.

(4) That a copy of these resolutions be sent to the

Hon. Locke Craig, Governor; and to the assembly of North Carolina.

The convention met Wednesday morning, February 12th, and Mayor J. E. Rankin, of the city of Asheville, delivered the address of welcome, on behalf of the city. Lieutenant-Governor Daughtridge, representing Governor Craig, who found it impossible to attend, welcomed the delegates on behalf of the state of North Carolina. Responses were made by delegates from half a dozen states, including a very enthusiastic response by Col. Dell M. Potter, of Clifton, Arizona.

At the afternoon session Colonel Potter presented a constitution and by-laws for the association, which were referred to a committee and later adopted.

After the preliminaries were over the contest as to the location of the route started. It was opened by Hon. F. H. Hyatt, of South Carolina, president of the South Carolina Good Roads Association, who urged that the line run from Washington to Columbia, following the Capital Highway, thence to Atlanta and through the states of Alabama, Mississippi and Texas. He urged this as the logical all-the-year round route, which will meet with the approval of the majority of the southern people and the southern representatives in congress.

Mr. F. B. Barrett, of Georgia, took a like stand and urged that the road be built through Georgia.

Mr. Cyrus Kehr, of Knoxville, Tennessee, urged that the road pass through the Southern Appalachian region, declaring that travelers over the highway will be cheated out of the greatest scenic region in the world, if the mountains are missed. He declared that that with Mt. Washington as a drawing card, the New

England states are getting rich, while in the southern Appalachian region there are forty mountains higher than that peak.

Hon. W. S. Keller, state highway engineer of Alabama, expressed the belief that it would be unwise to adopt the Tennessee line and Mr. Bruce Kennedy followed him, also opposing the Carolina-Tennessee route.

Dr. C. P. Ambler and Bishop James Atkins, of Asheville, spoke for North Carolina, favoring the adoption of the North Carolina-Tennessee line. Thursday morning was devoted to speech-making and most excellent addresses were delivered by Colonel Potter, Congressman Church, of California, Congressman Warburton, of Washington, Dr. Joseph Hyde Pratt, Mr. F. H. Hyatt, Dr. S. M. Johnson, of New Mexico, James Maret, of Kentucky, and others.

After a fierce fight on the floor of the convention in which representatives of North Carolina, South Carolina, Georgia and Alabama took part, the following route was adopted:

Beginning at Washington, D. C., following the route of the Quebec-Miama Highway by way of Richmond to Durham, connecting at that point with the central highway. From Durham, the eastern terminus of the line goes to Morehead City, N. C. The main route of the road continues over the Central Highway to the Tennessee line; thence by way of Knoxville to Nashville and Memphis, crossing the Mississippi river at the last named place and continuing across Arkansas by way of Little Rock to Texarkana, Dallas and Fort Worth, and touching the New Mexico line at a point about eighty miles east of Roswell, going from Roswell to El Paso. The route was adopted by a vote of forty-one to twenty.



A fine gravel road near Emporia, Virginia. This is a part of a three mile stretch built by the county recently

ty-nine, each state voting according to its representation in congress.

The convention placed itself on record as favoring federal aid, following the great speech of Congressman Warburton, in which he outlined the bill he has recently introduced in congress. The following resolution was adopted:

Resolved, That it is the sense of this convention that federal highway construction or participation in highway construction should be distributed approximately evenly among the states; that such construction should be such as to connect an important point in one state with an important point in an adjoining state, whereby a system of main highways will eventually connect all the states; that for the development of such



A Beautiful Sand-clay road built by the county convict force, near Statesboro, Georgia

a system this convention favors giving preference to federal highways thus connecting states in such manner as to form long courses of travel so located as to accommodate large amounts of traffic, and then connecting near-by states with such long courses by means of sections of highways leading from important points in said states.

The convention will at once take steps to interest congress in the great Southern National Highway and another meeting of the convention will be called by the president.

After the adoption of the constitution the conven-

tion went into the election of officers which resulted as follows:

President, Col. Dell M. Potter, of Clifton, Arizona; general vice president, Col. Benahan Camron, of Stagville, N. C.; secretary, D. R. Ellis, of Clifton, Arizona; treasurer, F. W. Jackson of San Diego, Cal.; vice president, W. S. Keller, of Montgomery for Alabama; F. H. Hyatt, of Columbia, for South Carolina; Dr. C. P. Ambler, of Asheville, for North Carolina; for Virginia, James Cannon, of Richmond; for Kentucky, Jas. Maret, of Mt. Vernon; for Tennessee, Cyrus Kehr, of Knoxville; for Arizona, Patrick Rose, of Globe; for New Mexico, F. Cox, of Silver City; for Colorado, A. S. Spalding, of San Diego; organizer—For Alabama, Bruce Kennedy, of Mobile; for North Carolina, G. D. Canfield, of Morehead City; for Virginia, Preston Belvin, of Richmond; for Arizona, L. L. Henry, of Globe, for New Mexico, S. M. Johnson, of Roswell; for Colorado, Ed Fletcher, of San Diego. The other vice presidents and organizers will be appointed at a later date.

Virginia Road Builders Will Meet March 17 and 18

The Virginia Roadbuilders Association, composed of engineers, contractors and county officials of the state of Virginia engaged in building roads, will hold a meeting in Washington March 17th and 18th. Secretary C. B. Scott, of Lynchburg, is expecting a large attendance and a very profitable meeting.

The program for the meeting is one of no little interest and importance. The opening address will be made at 10 o'clock on the morning of the 17th by Hon. Logan Waller Page, director of the Office of Public Roads, and his subject will be "Stone for Macadam Road Purposes." He will be followed by Hon. P. St. J. Wilson, state highway commissioner of Virginia, who will speak on the "Relation of State and County Road Authorities in Virginia." Maj. Edwin H. Gibson, commonwealth's attorney of Culpeper county, Virginia, will tell of "Road Building in Culpeper County." In the afternoon a representative of the Office of Public Roads will pilot the delegates over some of the improved roads around Washington.

The speakers of the second day are: Mr. C. S. Reeve, chief chemist of the Office of Public Roads, whose subject will be "Bituminous Road Construction;" Mr. Wm. J. Cocks, assistant engineer, Virginia State Highway Commission, on "Highway Construction in Mountainous Districts;" Mr. John T. McKinney, a prominent contractor, on "Road Building From the Contractor's Standpoint;" Mr. W. I. Lee, county engineer of Tazewell County, Virginia, on "Organization of Construction Forces and Reports;" Mr. C. B. Scott, assistant engineer, Virginia State Highway Commission, on "Road Maintenance."

In the afternoon of the 18th officers will be elected for the coming year and there will be a meeting of the executive committee, followed by a sight-seeing tour of the city of Washington.

A second federal aid convention is to be held in Washington immediately after the new congress meets. The first of these conventions resulted in a bill to appoint a joint committee to study the road problem and suggest a federal aid program. The second will work along the same lines as the first and even greater results are almost sure to follow.

The city of Galveston, Texas, is asking for bids on a large amount of street paving, concrete sidewalks and culverts.



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Official Organ Southern Appalachian Good Roads Association

DR. JOSEPH HYDE PRATT, President, Chapel Hill, N. C.
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F. H. HYATT, President, Columbia, S. C.
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CONVICTS AND ROAD WORK.

Warden Thomas J. Tynan of the Colorado state penitentiary, is teaching the world a new respect for the convict. He has gained fame of recent years for his treatment of convicts and being able to tell of his work in an interesting and pleasing manner he has been much in demand of late all over the union. He has not been able to fill all of the appointments that friends, admirers and the curious desired him to fill but he has spoken in several states and has always made a fine impression.

Warden Tynan believes in the reformation of the criminal and that discipline should be directed always to that end. He does not believe that punishment will work reformation and he does not punish the men who are sent to prison in his state.

A few years ago Warden Tynan and his associates devised and put in operation Colorado's famous parole system. The prisoners are treated exactly as men out in the world are treated, with the same respect and courtesy and the same regard for their rights. Those not needed to keep the various departments of the penitentiary in operation are put on their honor and sent out to build roads. There are no guards, no stripes, no shaven heads, no lock-step. For good behavior and

first-class work, the convict gets ten days off each month of his sentence. Very few prisoners have attempted to escape since the plan has been in operation and some of these were captured and brought back by the convicts themselves, while others repented and voluntarily surrendered.

Warden Tynan is preaching a fine gospel. We would like to see his plan adopted in every state in the union and we believe that the time is coming when it will be done.

TEXAS.

Texas is a whaling big state and it does things in a whaling big way. Things that other states strain over and do with the utmost difficulty are easy for Texans and they say but little about it.

Recently, Harris county voted a bond issue for the building of roads of one million dollars. There were so few votes cast against the bond issue that the papers said that it was carried by a practically unanimous vote. And they didn't make much fuss about it.

Along with the newspaper report of the bond election was a paragraph stating that Harris county already had 340 miles of paved roads. Think of that—340 miles of good roads and a million dollar bond issue to build more, all in one county.

Last year twenty-five counties voted bond issues aggregating more than \$3,500,000. Year before last, about \$5,000,000 of bonds were voted.

This year Texas is making a fine start at the road-building business and may even eclipse the record of 1911. In the month of January \$495,000 on bonds were voted. While official statistics for February are not yet available, it is certain that bond issues for the month will not fall under \$1,300,000 and may go to a million and a half.

The people of Texas are coming out of the mud. No wonder that the population of the state is increasing rapidly. It is fast becoming a very desirable state to live in.

Recently the Southwestern Farmer and Breeder published at Fort Worth, reviewed the bond issues of the past few years and made the statement that there were a number of counties in Texas that had expended a million dollars or more, each, for good roads, all of it raised by bond issues and the paper went on to state that every one of these counties, without exception, was highly pleased with the results of these heavy expenditures for roads.

We like the Texas spirit. We hope that it will spread abroad in the land, overflowing the state boundaries and covering the entire south.

TREES BY THE ROAD-SIDE.

The Rotary Club, of Houston, Texas, and the Galveston Commercial Association, have started the work of setting out trees along the fine shell highway, fifty miles in length, that connects Houston and Galveston. The first trees were set out February 22 on the Houston

end of the road. The trees are camphor trees and are set 120 feet apart on each side of the road. It is planned to set oak, elm and other trees between these, giving trees sixty feet apart on both sides of the road.

This is a fine idea and one worthy of the attention of road-builders all over the country. Too often the beauty of the country-side is marred by the builders of roads who cut and slash the fine trees along the roads unnecessarily. Some tree-cutting is necessary, of course, but due regard should be had always preserving the natural beauty of the land-scape. Travellers tell us that one of the chief beauties of roads in many parts of Europe is the fine lines of trees along the sides of the roads.

Some time ago a noted North Carolina educator wrote an able article on this question, advocating the planting of pecans trees along the highways and he presented figures showing that the income from the trees in a few years would amount to an enormous sum.

GOVERNOR SULZER ON ROADS.

Governor Sulzer, of New York, is a road-booster of the right type. He has been in the boosting business many years and now that opportunity is his to do some real effective work, he is doing it. In his recent message to the New York legislature Governor Sulzer "laid down the the law" to the legislators in no uncertain terms, pointed out defects in New York's road laws and pronounced the doom of the spoilsmen who had been fattening on the people's money. In his message he paid this great tribute to good roads:

"We know that good roads, like good streets, make habitation along them most desirable; they enhance the value of farm lands, facilitate transportation, and add untold wealth to the producers and consumers of the country; they economize time, give labor a lift and make millions in money; they save wear and tear and worry and waste; they beautify the country and bring it in touch with the city; they aid the social and religious and educational and industrial progress of the people; they make better homes and happier firesides; they are the avenue of trade and the agencies of speedy communication; they mean the economical transportation of marketable products—the maximum burden at the minimum cost; they are the ligaments that bind the country together in thrift and industry and intelligence and patriotism; they promote social intercourse, prevent intellectual stagnation and increase the happiness and prosperity of our producing masses; they contribute to the greatness of the city and the glory of the country; give employment to our idle workmen, distribute the necessities of life—the products of the fields and the forest and the factories—encourage energy and husbandry, inculcate love for our scenic wonders, and make mankind better and happier."

BAD ROADS AND ILLITERACY.

We have had occasion to speak more than once of the relation between bad roads and illiteracy and we have tried to bring home to our readers the all-import-

tant truth that the welfare and development of the child of the woods and fields depends largely upon the roads. The city child is cared for. There are good streets and sidewalks and long terms of school. The country child must wade through mud and slush to a poor school-house and a poor teacher and put up with a short term of school. The difference is simply a difference of roads and nothing else, for with good country roads there come always good school buildings, good teachers and long terms, because good roads enhance land values, make farming profitable and enable children to attend school every day of the term.

Take these facts and see what you get out of them. In five good roads states, Massachusetts, Rhode Island, Connecticut, Ohio and Indiana, 77 per cent of the children of school age are in school. These states have improved 35 per cent of their roads. In five bad roads states, Alabama, Mississippi, Georgia, Arkansas and South Dakota less than 60 per cent of the children of school age are in school, and these states have improved less than 2 per cent of their roads. In four bad roads states, Arkansas, Missouri, Mississippi and North Carolina, there are 8,000,000 people and 375,000 native-born white people cannot read and write. In four good roads states, Massachusetts, Rhode Island, Connecticut and New Jersey, there are 6,000,000 people and only 20,500 native born white men and women cannot read and write.

The Studebaker Corporation's catalogue No. 805 for 1913 has just been issued. It is devoted to dump wagons exclusively and is a mighty handsome bit of printer's art. The regular line of wagons is well played up but the outstanding feature of the catalogue is the new Steel Frame Dump Wagon.

In a letter to Southern Good Roads, Mr. O. S. Barrett, head of the advertising bureau of the Studebaker Corporation, tells of a test to which one of these new wagons was put lately. It was loaded with six tons of cast skeins, a shifting load, as it were, and hauled by an electric truck over the very roughest roads and pavements, crossing railroads, up and down curbs and tested in every possible way. The speed was eight miles an hour and the wagon came out of the ordeal without the slightest damage. Truly, few dump wagons could have made as good a record.

This new wagon has many features that other wagons have not and promises to be a red-hot favorite in the road-building season of 1913.

Permanent Pavement is the name of a new publication, the first issue of which has just reached us. It is a periodical devoted to the use of concrete in roadbuilding and is issued by the publicity bureau of the Universal Portland Cement Co., of Chicago. It is a very interesting little magazine, bright and full of striking facts and figures.

Culpeper county, Virginia, is asking for bids on 24 miles of macadam and will receive bids for the work up to the 18th of this month.

The Texas Motorway Company has been incorporated at Dallas, Texas, to build an automobile highway from Dallas through to Val Verde county, a distance of 500 miles.

Road-Building, Road-Boosting and Road-Boosters Throughout the Nation

Senator Jonathan Bourne, Jr., chairman of the joint committee of congress on federal aid in the construction of post roads, has submitted a preliminary report that "heads" anything that has come this way in many a moon in the way of comprehensiveness. Through Hon. P. C. Knox, secretary of state, he made inquiry of the government's many representatives in foreign lands as to the question of government aid in the various countries of the world. These inquiries brought much valuable information and all of it is set down in the report.

He also wrote to the governors of all of the states of the union and their replies are included in the report. The state highway commissioners of all of the states having such officials, contributed their opinions and the report is something worth having around. In the back of the report is a table in which is compiled all of the information so far obtained.

If you haven't a copy of this report, write for one.

* * *

Who has not been annoyed by the tearing up of good streets for water mains, underground cables, etc., to the point of desperation? There is nothing that makes the average citizen madder than to come up street some fine morning and find a section of high-grade street roped off and little red flags unfurled to the breeze. The citizen may well be indignant for it is absolutely certain that the street will never be as good again and his money paid for it. The record of the majority of our city streets shows many tearings-up and many puttings-down and is tersely described by an unknown poet as follows:

They took a few old brick, and they took a little tar,
With various ingredients imported from afar.

They hammered it and rolled it, and then they went
away—

They said they had a pavement that would last for
many a day.

But they came with picks and smote it to lay a water
main,

And then they called the workmen to put it back again.
To run a railway cable they took it up some more,
And then they put it back again just where it was
before.

They took it up for conduits to run the telephone,
And then they put it back again as hard as any stone
They took it up for wires to feed the electric light,
And then they put it back again, which was no more
than right.

Oh, the pavement's full of furrows, there are patches
everywhere;

You'd like to ride upon it, but it's seldom that you
dare.

It was handsome pavement, a credit to the town,
But they're always diggin' of it up, or puttin' of it
down.

* * *

Mr. D. Ward King of Missouri is to deliver a series of addresses in Florida during March. His topic will be the split log road drag; or How to Build Good Roads Without Money. On Monday, the tenth, he will

speak in St. Augustine: On Wednesday, 12th, in Miami; on Friday, 21st, in Tallahassee. Other appointments will be made known a little later.

* * *

The Good Roads Machinery Company, of Kennett Square, Pa., has just issued a new culvert pipe catalogue, showing their complete line of corrugated smooth bottom culvert pipe and F. & E. cast iron interlocking culvert pipe. The catalogue contains a great deal of very valuable information for road officials and shows some mighty fine pictures of the company's culverts after installment.

* * *

The following extract from the 1912 report of the state road commissioners of New Jersey, is very complimentary to the Robeson Process Company, the manufacturers of Glutrin. The report says:

"The gravel roads of South Jersey are all that can be desired during a large part of the year, but during some parts of the winter and in the spring, when the frost is coming out of the ground they become soft and slippery, and it is often very difficult to go over them.

"Various materials are now being used to try and make these roads 'hard, firm and convenient for travel at all seasons of the year,' as provided by law.

"In the fall of 1911 glutrin, was applied on a short piece of the Meadow boulevard, the gravel road connecting Atlantic City with the main land. During the spring of 1912, which was an usually severe one on the roads, this piece showed a marked improvement over the adjacent untreated sections, being more thoroughly bonded. Consequently it did not rut and it proved to be very satisfactory.

"The main road from Camden to Atlantic City was badly heaved in many places during the spring. These places were fixed temporarily with cinders in order to make the road passable. Gravel was put on later, and in the fall the Atlantic county section of the road was treated with glutrin. Before applying the material the road was scraped, to remove any existing inequalities. The glutrin was shipped in barrels, pumped by hand into an ordinary sprinkling wagon which was first filled half full of water, and this mixture sprinkled on the road at the rate of about one-half gallon of glutrin per square yard of surface."

* * *

Joseph E. Wing, a northern farmer, came south a few months ago prospecting with a view to buying land in the south. When he got back home he wrote a letter to the Breeders' Gazette in which he contrasted very strikingly road conditions in two states that he visited. Among other things he said:

We were cruising for land in—well, never mind what state it was; it might have happened in almost any state. It was not exactly a new country, but it was rather sparsely settled. None of the roads had been graveled or macadamized and it had rained a very great deal. The roads were very primitive, yet they were nicely rounded up and had been kept nicely dragged. We overtook and passed a four-mule team hitched to a King drag; the use of the team was paid for by the community. After each rain it is the custom to drag these roads. We grumbled a little at the oc-

casional chuck holes, but in the main the road was delightful and our horses trotted briskly along. We gave the roads so little thought (we do not think about things that are giving us little trouble) that we had time to inspect the farms that we passed by and to discuss their advantages and desirabilities.

Suddenly we left the good roads. We came into another state and to a region where roads are neglected. It was after a wet winter. The roads were awful. Now and then they became impassable and we took to the pastures to avoid dangerous mudholes. When we found any "repair work" done it was of the crudest sort, like throwing branches of trees into the mud. Two strong horses attached to our buggy began to become distressed as they labored through the mud. The soil and topography were the same as we had left, the sole difference that now no one dragged the roads. We were at first amused, then frightened, then indignant. It seemed that we would never without killing our horses get through. Finally we met a man with good horses and a buggy, going in the opposite direction. We halted him and demanded, "Why are not these roads dragged?"

"I can't tell you, sir. I reckon because we never have done it."

I would not accept a farm on those undragged roads as a gift and live on it as men do today. Civilization, education, progress—these things are impossible where such roads are. Further, the effort of horses to drag vehicles through that mud is at least fifty times the effort that would be necessary to keep those roads dragged dry and drivable.

* * *

Contending that the National Government's first concern should relate to the main roads of the country, and again placing itself squarely on record as opposed to any piecemeal and wasteful distribution of federal funds, the American Automobile Association representatives appeared at Washington, before the joint committee of congress at its evening session of February 10. The plea was made that in this day of multiplying roads travel, diversified to an epoch-making degree, any project for federal participation in highways construction should involve a general inter-state system of highways equitably apportioned among the various states.

The A. A. A. delegation which appeared before Chairman Jonathan Bourne, Jr., and his associates of the joint committee, was headed by President Laurens Enos, who, after setting forth why the automobilists devoted so much effort to the roads question, introduced George C. Diehl, chairman of the A. A. A. National Good Roads Board. In the argument of Mr. Diehl he explained that the association for which he spoke stood ready to co-operate along any lines which would safeguard the use of federal money and insure tangible, real, and permanent results. Mr. Diehl predicted that from the thorough investigation of the subject by the joint committee it was inevitable that its deductions would supply a concrete plan in comprehensively presenting the matter to the country for its consideration. Since Mr. Diehl is a civil engineer and has had an experience of years in roads matters it was possible for him to answer comprehensively the fusillade of questions propounded by the members of the committee. Vice-Chairman Shackelford, who is one of the most insistent roads advocates in the house of representatives, supplied a goodly quantity of the inquiries.

* * *

It is encouraging to note that the new congressmen, of whom there are 100, are beginning their congress-

sional careers in the right way. A large majority of them are deeply interest in the road question and many have expressed themselves as favoring federal aid. Following are some expressions from a number of the latter in regard to federal aid:

Hon. C. F. Curry, 3rd California: "I believe in National participation and federal aid in highway construction, in inter-state highways reaching into every section of the country, provision for the payment of which shall be equitably apportioned among the several states and the federal government, when a proper basis of co-operation for the construction of such roads shall have been arrived at."

Hon. Frank T. O'Hair, 18th Illinois: "Speaking to the point, I will say that I am in favor of good roads, and that the government shall formulate a system by which government aid may be bountifully expended in assisting in the upbuilding of our roads all over the country."

Hon. Allen W. Barkley, 1st Kentucky: "Nothing would conduce more to the prosperity and happiness of our people than a general system of improved highways, and I am convinced if this result is to be brought about the national government should co-operate with the states in the permanent improvement of their roads."

Hon. Allan B. Walsh, 4th New Jersey: "A net work of good roads well made and properly maintained would, I believe, be a large factor in the fuller development and more thorough unification of the whole country. Proper maintenance of roads when made tends toward economy. Both the making and maintenance of good roads would seem, therefore, to be important objects of state and national legislation."

Hon. Howard Sutherland—M. C. At Large, West Virginia: "I have advocated federal aid in the building of good roads for many years, and will do all that lies within my power to advance the federal aid plan and assist in every other way in agitating the subject of good roads and in building them."

* * *

A very interesting item of news to the farmers of America is the fact that several influential railroad managers are enthusiastically in favor of improved trunk line highways and will do what they can to encourage congress in putting through the right sort of federal aid law. Railroad men with clear vision see that the development of good roads and the increased use of the motor vehicle is bound to swell the volume of their own business, particularly through those vast areas of the country not yet fully developed. The greater part of the American continent still belongs to this partly developed classification.

* * *

President John Craft, Vice President John W. O'Neill and Mr. John A. Rogers, of the Alabama Good Roads Association, were honored by an invitation to attend the federal aid hearing in Washington February 10 and appeared before the joint committee of the house and senate.

* * *

The contract to build permanent good roads in Adams county, Mississippi, for which a bond issue of \$150,000 was voted, was awarded to P. W. Mulvihill, Sr., of Natchez. Mr. Mulvihill offered to do the work for \$130,970. His bid was found to be the lowest. The other bidders and amounts of their bids follow: S. A. Gayno, Jackson, \$132,581; Healy Construction, Meridian, \$142,430, and the Worthington Construction Company, Meridian, \$149,367. Mulvihill's bid is \$30,000 more than was that of the Garreston-

Brewer Company of Jackson, which first was awarded the contract when the bids were opened, several months ago. The Jackson concern later admitted it had made a mistake in the estimate, and let the contract go by default.

* * *

In five years preceding March, 1912, the office of public roads of the department of agriculture has built 215 object-lesson roads; in all, about 300 miles of road 15 feet wide, and by expert advice aided in the formulation of more than 650 model county road systems, resulting in most instances in beneficial reforms. It has also assisted 26 states in effecting equitable state-aid plans. The director, Hon. Logan Waller Page, looks forward to the coming year as promising better results than at any time in the history of the movement for improved highways.

* * *

There was an interesting meeting at Cuero, Texas, last month in the interests of the Alamo-San Jacinto Trail and of improved highways between Houston and San Antonio. There were delegates present from De Witt county, Victoria, Gonzales and Seguin and the meeting was marked by quiet determination to get results.

The business men of Cuero turned out in force, the meeting in the city hall being attended by more than 200. Rev. C. H. Cross presided and Secretary G. H. Harris of the Commercial Club extended welcome to the visitors. After disposing of committee reports on local roads, addresses on road building along the line of the projected highway were made by D. E. Colp, secretary of the highway division of the San Antonio Chamber of Commerce, and George D. Marshall of Washington, D. C., highway superintendent in the Bureau of Public Roads. Mr. Marshall answered numerous question regarding road construction.

The most direct route between Cuero and neighboring communities in De Witt and adjoining counties came in for considerable discussion.

There was another meeting a day later at Edna, Texas, when the Alamo-Victoria-San Jacinto Highway Association met in regular session. This gathering was also very well attended.

* * *

The Chanute Auto Club, of Chanute, Kansas, at a recent meeting, awarded cash and merchandise prizes to five men who had made the best record in dragging the roads around Chanute during the past year. The value of the prizes awarded aggregated \$200 and were donated by the business men of Chanute. The men who did the dragging are to be the guests of the club at a banquet to be given soon. The Auto Club last year spent \$300 to build drags and offer bonuses to workers, paying 25 cents per mile for dragging in addition to the 50 cents per mile given by the township.

* * *

Commenting on one of Colonel Lafe Young's good roads propositions the Council Bluffs (Iowa) Nonpareil, says:

"Col. Lafe Young advocates the creation of a good roads commission with a talker to go about the state promoting good roads gospel. There is no doubt but that Mr. Young can put his hands on the shoulders of a man who would fill this same office of talker, to mighty good advantage unless, perchance, his arms are stiffened by rheumatic affliction."

Colonel Young is editor of the Des Moines Capital and one of the liveliest good roads men in the nation. He it was that originated the co-operative road-building idea and brought about the building of 380 miles of road in

one day in Iowa. He would be the very man for the job.

* * *

Mr. George D. Marshall, a highway expert in the employment of the U. S. Office of Public Roads, who has been engaged for several weeks in building roads in Texas, was the principal speaker at the meeting of the Iowa State Highway League at Cherokee, Iowa, recently.

Mr. Marshall has just completed the construction of one mile of sand-clay road in Bexar county, close to the Atascosa county line, at Lytle, and is also advising several other southwest Texas counties regarding their roads and how best to improve them. In company with D. E. Colp, secretary of the highway league division of the San Antonio Chamber of Commerce, he has visited many of the counties in that part of Texas, and made addresses on "Good Roads and How to Build Them," and he has been as successful in interesting the people in this subject as he has been in building roads.

Mr. Marshall has returned to Texas and is at work in the territory around San Antonio.

* * *

The road bond elections held in Texas during the month of January carry a lesson of unusual importance to the members of the legislature, presenting, as they do, an unquenchable desire on the part of the progressive public for the improvement of the public highways and, give a working demonstration of the resisting power of the state's present laws to progress.

Five bond elections were held, resulting in three issues of \$495,000 and in two elections the bond issue was defeated amounting to \$190,000. Ten elections were called during January involving a total bond issue of \$2,115,000 to be held in February. All the January elections carried on a majority basis, but two fell short of a two-thirds vote.

There is as much reason why the state of Texas should teach its citizens the elementary principles of progress, as that it should teach the children to read and write, yet during the three-quarters of a century of the state's existence, it has never spent one cent in encouraging the improvement of its public highways.

* * *

The membership committee of the Alabama Good Roads association composed of Senator John H. Bankhead, Congressman Oscar W. Underwood, John Craft, John W. O'Neill, J. A. Rountree, State Senator W. T. Brown, Hugh McGeever and John A. Rogers, have recently elected 100 additional Alabama citizens as life members of the Alabama Good Roads association.

* * *

During the last fiscal year, 535,433 yards of shell were sold by the game and fish wardens of the state of Texas, for a total amount of \$13,431.85. Of this amount, 200,250 yards were sold to counties of which Galveston county took 122,914 yards. Harris county was second with 73,607 yards. Private parties consumed 268,637 yards, while the state used but 946 yards. Houston led the cities in the use of shell with 38,735 yards and Galveston was second with 17,196 yards. These shells are used in the construction of roads and pavements, for which they are admirably adapted.

* * *

A meeting of the directors of the Interstate Good Roads Association has just closed at Bowie, Texas. This association is made up of the good roads organizations in the several counties, along the line from Fort Worth to Fort Sill, and comprises the counties of Wise, Montague and Clay, in Texas, and Cotton and Comanche, in Oklahoma.

GOOD ROADS NOTES

GATHERED HERE *and* THERE

Alabama.

In Marshall county, Alabama, they have a board of county commissioners of the right sort. Usually some organization or some group of individuals take the initiative for good roads bond issues and like things, and the board of commissioners, for political reasons, waits until it sees just how the "cat is going to jump." In Marshall the board of commissioners brought about the calling of a mass-meeting of citizens on the last Monday in February at the courthouse in Guntersville.

Nearly every part of the county was represented and numbers of talks were made by leading citizens from each sections of the county, and the meeting was practically unanimous for bonds and good roads.

The citizens of Guntersville and vicinity have raised \$1500 to be used on the road from Guntersville to Warrenton, and the commissioners have made an appropriation so that the aid of the state road fund can be secured. Marshall county is wide awake on the good road subject and it will not be long before it will be ranked as one of the leading counties in this line as well as in other lines.

The commissioners will hold a meeting and set the date for an election for bonds to the amount of about \$125,000 for the purpose of building roads.

John W. O'Neill, vice president of the Alabama Good Roads' association, who was summoned by the joint committee of congress appointed to investigate the question of federal aid in the construction of post roads throughout the United States has returned from Washington and is confident that congress at its next session will pass the bill appropriating \$100,000,000 to aid in maintaining post roads.

"Out of this first annual appropriation to the road fund, Alabama will derive a considerable sum," said Mr. O'Neill. "In fact it is estimated by some experts that Alabama will get \$10,000,000 from the first appropriation.

"The bill proposes to give \$60 per annum to first class post roads, \$30 for second class and \$15 for third class roads. Alabama now has about 35,000 miles of post roads. This money from the government is to be turned over to the officials of the counties that have charge of the roads and no money can be received unless the roads are kept up. Government experts will have the inspection of the roads to look after."

Mr. O'Neill was placed on the witness stand by the committee and asked numerous questions pertaining to the road laws of Alabama. He informed the committee that state aid was working successfully in Alabama and that the people desired federal aid in maintaining their roads.

Captain John Craft, member of the state highway commission accompanied Mr. O'Neill to Washington.

* * *

Florida.

The following are the gleanings of a day from representative newspapers of Florida on road topics:

We have all complained of the condition of the public roads and expressed our wish for something better. We now have a chance to prove our sincerity in the matter. The proposed bond issue is a start in the direction of better roads. If we turn it down it will prove

that we were not so much in earnest about road improvement after all.—Starke Telegraph.

Columbia county has made a good start toward improving its roads, but more work must be done if we choose to keep pace with the balance of the state. Many counties have issued road bonds and are spending large sums in building hard roads throughout their respective counties. Columbia county should do something in that line and a bond issue should be considered by the voters of the county before long. Better roads will make a better and more prosperous county and every farmer will benefit thereby.—Lake City Index.

The good roads advocates of Florida will ask the next legislature to pass five bills. First: To provide for a state commissioner of good roads, who will supervise all good roads building operations in the state, so that all counties will work in harmony. Second: To provide for a county superintendent who will have charge of all road building in his respective county. Third: To make an appropriation to assist small counties which are not financially able to build good roads for themselves. Fourth: A law to regulate state and county license. The fifth bill desires the abolition of the convict lease system and the placing of the convicts to work on the public highways.—ChIPLEY Banner.

The Tampa Tribune is immensely in earnest with its plan to bond the state for \$50,000,000 to secure a comprehensive system of good roads. We sincerely respect its enthusiasm in the matter, nor do we condemn its judgment for the benefits of such a system of highways are too obvious to be disputed; but will the people of Florida consent to pay the price? It is a very stiff undertaking for a state yet in the infancy of its development, and it would take a very large-minded, public-spirited, eagle-visioned electorate looking far beyond the present to a mighty future, to forget the taxes and the day of redemption in their enthusiasm for the cause. But like the equal suffrage amendment to the constitution, there is no harm in trying.—Lakeland Telegram.

* * *

Iowa.

The Iowa legislature named a joint committee of the two houses to draft a bill that would meet the demands of the progressive road advocates of the state and this committee spent two weeks on the work, making the following recommendations which will be drafted into a comprehensive highway bill:

Establishment state highway commission with ample authority. Commission to consist of three members appointed by governor. Three members to select competent state highway engineer.

County engineers for all counties to be employed by supervisors with approval of highway commission.

Classification of all highways into county and township roads.

From 10 to 15 per cent of roads in county to be designated as county roads to be under supervisors and county engineer.

All moneys expended on these roads to be in line of permanent work. No money to be paid except on approval of engineer.

All bridges and culverts, county and township, to be built in accordance with general plans of state high-

way commission under direction of county engineer.

All township work to be put by trustees in hands of one man to be known as superintendent of township roads, who shall make all contracts for dragging and temporary repairs.

Two mill levy to be placed in compulsory drag fund to be paid out by superintendent for that purpose only.

In case superintendent does work of grading on township roads the county engineer must go over roads giving profile so that grading can be done systematically and township roads may be put in same condition as roads designated as county roads.

The subcommittee was not so certain of its stand on the tax levy and it was decided to split that question away from the features which were given unanimous support. Following is the outline which was given the drafting committee for its work:

One mill levy for state aid to be raised from all taxable property in state including all property in cities, but same to be expended only on country roads for permanent highways. Work to be in charge of supervisors with county engineer under direction and approval of state highway commission.

* * *

Kentucky.

A campaign for a good roads bond issue of \$500,000 for Bell county, Kentucky, was started at Middlesboro last month when Circuit Judge W. T. Davis, County Attorney C. I. Dawson, Attorneys E. N. Ingram, H. B. Jones and J. G. Rawlings, Drs. J. Harry Hendren, Frank Baker and O. P. Nichols, Jackson Morris and County Judge B. A. Fuson organized a whirlwind speaking campaign to stump the county. They will speak in every school precinct in the county, telling the voters benefits of good roads and why they should vote this bond issue.

* * *

Minnesota.

During 1912 the State Highway Commission of Minnesota handled business to the amount of \$1,800,000 and graded and constructed 627 miles of roadway in the state, according to an abridged report which was presented to the state senate. In addition the commission has had supervision of the county and township roads throughout the state involving the construction of many more miles of highway to which the state did not contribute directly.

According to the report the commission during the present year will handle work involving an expenditure of \$1,500,000. The state spent \$310,000 last year in improving and building highways.

The report says that in addition to the big volume of road work done, 133 concrete culverts were built last year. The number of corrugated metal culverts constructed was 346. Ninety steel, and eight concrete bridges, were built during 1912. Most of the roadways built were of earth construction. In all 169 miles of gravel roadway were built. But one mile of concrete highway was constructed by the commission, because construction of roads by concrete is an experiment.

* * *

Mississippi.

Several counties of Mississippi are now engaged in red-hot campaigns for bond issues. A mass-meeting at Greenwood on the 3rd instant, gave a big send-off for a bond issue of \$300,000 for good roads in Leflore county. This county spent \$80,000 on the roads during the past year but only here and there were roads that

were passable in all kinds of weather. The people seem to want permanent roads and will probably have the opportunity of voting on the question soon.

The mass-meeting was addressed by R. E. Toms, a highway engineer in the employ of the U. S. Office of Public Roads, and several other prominent speakers.

* * *

New York.

The State Highway Department of New York in a formal statement says that of the bond issue of \$50,000,000 authorized by the electors last fall to carry on the improvement of highways \$20,000,000 will be used for state highways and \$30,000,000 for the portion of the cost of county highways payable by the state. None of the county quota can be used for any other purpose. Attorney General Carmody said some time ago that the legislature had no power to authorize Boards of Supervisors to permit the Highway Commission to reapportion funds.

The method of apportionment of the entire amount among counties is: First, on population as fixed by the federal census of 1910; second, on the mileage of public highways outside of cities and villages as obtained pursuant to Section 69, Chapters 30, Laws of 1909; third, on the total area.

Two-fifths of the total amount of funds apportioned to any county must be expended in the county to construct or improve the portion of the state routes mentioned in Section 180 of the Highway law within the county, and three-fifths to pay the state's portion of the construction or improvement of county roads within its borders, to be determined by the Highway Commission with the approval of the county supervisors.

This method of apportionment, the Highway Commission says, created an interesting situation, as some counties had too much state or county mileage, while others had too little within their boundaries according to the apportionment of the funds.

Anticipating that the legislature this year will appropriate \$10,000,000 for good roads construction from the \$50,000,000 bond issue, Superintendent C. Gordon Reel, of the State Highway Department, has prepared plans for upwards of 1,000 miles of highway improvement to be placed under construction as soon as the funds are available. He plans to let the contracts for the construction of approximately 400 miles of state and 600 miles of state and county highways in March so that the contractors will be able to take advantage of the entire construction season.

Superintendent Reel also announced that he has planned that the work of highway improvement and maintenance for the year shall be in conformity with some of the provisions of the pending Murtaugh Highway Commission revision bill, and that, accordingly, he has divided the state into nine divisions instead of six as at present, and that auto truck repair gangs are being organized to supplant the present patrol system in counties which now have considerable mileage of improved highways.

* * *

Nebraska.

At the recent annual meeting of the Omaha-Denver Good Roads Association which was held at McCook, Nebraska, the name of the association was changed from the Omaha-Denver Good Roads Association to the Omaha-Lincoln-Denver Good Roads Association.

At the meeting the following officers were elected for the coming year: S. A. Searle, Omaha, president; G. E. Parisoe, Minden, secretary; W. A. Taylor, Hastings, treasurer; A. Barnett, McCook, first vice presi

dent; and C. E. Bowlby, Friend, second vice president. The five officers constitute the executive committee. Those named on the legislative committee were: G. R. Chatburn, Lincoln, chairman; G. E. Parisoe, Minder, A. Lavery, Ashland; H. E. Stein, Hastings, and B. A. George, Lincoln. Holdege was selected as the place of next year's meeting.

Reports submitted showed wonderful progress made in the cross-the-state highway, which has a nation-wide reputation as being one of the best maintained dirt roads in this country. The official route is now via Ashland, instead of through Louisville, the change being made on account of the permanency of the crossing of the Platte river, through the construction of the steel bridge at Ashland.

The financial statement of the association for the year is as follows: Receipts, \$1,234.08, disbursements \$768.18; balance on hand \$465.90.

* * *

Ohio.

Road improvement work in many parts of Ohio and particularly in the northwestern section will be greatly facilitated through the adoption of the bill introduced in the General Assembly by Senator Weiser, of Ottawa.

Several weeks ago when the supreme court held certain portions of the Garrett law to be unconstitutional it created a most chaotic condition. In a number of the counties bonds had been issued in anticipation of road improvement work which was to be done and which was to be paid for through the money secured from the sale of bonds. By the decision of the court these bonds were held to be worthless. Their total amount reached into millions of dollars. Levies and assessments authorized to be made to meet the payment of the work were also held to be of no avail and this simply added confusion to the situation.

An equally aggrieved situation came about in counties where road improvement work has been done, the bills for which were due. The total in this way reached into millions of dollars, but commissioners, by reason of the court's decision, found themselves unable to pay debts which had been contracted and for which they were honestly liable.

The result was an almost entire suspension of road improvement work in such counties as were affected by the decision. The Weiser bill will relieve the present distress of Ohio road-builders.

The new Ohio general assembly will be asked to make a general levy of one-half of one mill for road building, the proceeds to be available in 1914 and thereafter. It is estimated that this would raise between \$3,000,000 and \$3,500,000 annually.

The assembly further will be asked to appropriate \$1,760,000 to be spent under the present laws by the state highway commissioner. This would give each county \$20,000 to be used in the road building immediately and before the proceeds of the tax levy would be available.

Another request will be that the general assembly provide that the fund arising from the taxing of automobiles be used for the maintenance and repair of roads. It is proposed that all of the money raised for the inter county system of roads be expended under the supervision of the state highway commissioner.

* * *

Tennessee.

Hon. Cyrus Kehr, of Knoxville, Tennessee, whose good roads activities have been mentioned frequently in this magazine, is keeping up the good work. He has pre-

pared and presented to the Tennessee legislature a bill to create a state highway department. Commenting on Mr. Kehr and the bill the Knoxville Sentinel calls attention to the fact that Mr. Kehr has been actively engaged in good roads work for twenty-five years and that he is the Tennessee vice-president of the Southern Appalachian Good Roads association and as a delegate to the Southern National Highway association, recently was instrumental in securing the approval of that association, embracing all the southern states, to a project to connect Washington and Southern California with a highway passing through Asheville, Knoxville, Nashville, Memphis and thence through Arkansas and Texas, New Mexico and Arizona.

But the bill does not embody Mr. Kehr's individual ideas only. Many states have gone ahead of Tennessee in highway promotion and construction and the bill copies approved features of their highway legislation. These states have made costly mistakes and Tennessee can profit by their dear experience.

The bill, if passed, will create a state highway department, to embrace a state highway commission, a civil service board, a state highway engineer, a secretary, assistant engineers, supervisors, inspectors and other officers, employees and agents.

The commission is to consist of five commissioners and two assistant commissioners. The governor is to appoint three commissioners, one of whom shall be from the western division of the state and the other two from the state at large.

The state geologist shall be ex-officio a member of the commission and the fifth shall be selected by the University of Tennessee from its faculty. The commissioners and assistant commissioners will serve without salary, but will be allowed traveling and other necessary expenses. The professor of horticulture and forestry of the University of Tennessee shall be ex-officio an assistant commissioner and the other shall be appointed by the governor.

The commissioners have general direction of the road policy of the state and other duties natural to their positions.

* * *

Texas.

Gathering in Lampasas, Tuesday, February 18, members of the San Antonio, Blanco and Granite Belt Good Roads Association extended the scope of the organization to include a great north and south highway through Texas extending between San Antonio and Dallas, primarily and beyond Dallas on the north to the Red River, and south of San Antonio to Laredo and to the Gulf of Mexico. Membership in the organization was enlarged to include counties north of Lampasas and many new members enrolled.

D. E. Colp, secretary of the highway division of the San Antonio Chamber of Commerce, represented San Antonio. Burnet county sent a large representation, as did Bosque, Hamilton and Tarrant. Lampasas county was, of course, well represented.

The Hamilton county delegation included County Judge J. L. Lewis, county Commissioner Mack Schwartz and Messrs. Perry and Williams. County Commissioners Daugherty and Hutto accompanied by Messrs. H. E. Faubion, Joe Field, A. J. Cotton and L. W. Hooper represented Burnet county. W. H. Beck, assistant secretary of the Fort Worth Chamber of Commerce, attended accompanied by a party of Fort Worth good roads boosters.

Judge W. B. Abney of Lampasas, in making the address of welcome said that one good road would bring

others and that a main north and south line would be followed by laterals in every direction.

In replying, W. H. Beck of Fort Worth said the farmers need good roads more than any one else and that now, acting in harmony with owners of automobiles, the era of good roads had come and any community wishing to progress would have to recognize this fact.

Among those on the programme for addresses were D. E. Colp, who spoke mainly of the importance of a scenic highway, approximately 350 miles in length, which would extend through a country having scenery equal to any to be found in this country or Europe. He praised the roads in Lampasas county and said it was the only county in Texas, with one exception, that had been able to build good roads with special tax. This was due, he said, to the ability and business acumen of the county commissioners' court. He spoke of the importance of good roads, the kind of roads to build and the necessity for concerted action of all the people, farmers and business men.

County Judge Wilson of Lampasas county, Rev. W. B. Wilson of Bosque county, H. E. Faubion of Marble Falls and J. L. Lewis, county judge of Hamilton county, made interesting talks on good roads in general and the necessity for good roads in their respective counties. Other speakers included Lewis Jones of Burnet county, C. W. Connery of Fort Worth, C. D. Stokes of Lampasas, W. H. Beck of Tarrant county and W. F. Barnes of Lampasas county.

* * *

Washington.

Without a dissenting vote the Washington state senate passed the arterial road connection bill, one of the most important pieces of road legislation before the legislature. No doubt is held as to similar action being taken by the house, as there is no opposition to the measure.

George M. Colborn, one of the most energetic good roads enthusiasts in the state, spent several days in the state capital, and his efforts were largely responsible for the hearty second of the senators. Mr. Colborn said:

"This measure will enable us to eliminate the mud holes between state highways and city arteries, which are a big detriment. The new law will assess a portion of the cost of connecting to the abutting property and will take the balance from the general city and county funds. The cities are given authority to designate the arteries to be so improved. This measure has been a live issue in good roads circles of the state for a long time."

At Byers, Clay county, Texas, there was a lively mass meeting February 19, attended by delegates from Temple, Oklahoma, Bowie, Texas, and other places. The object of the meeting was to make arrangements for the finishing of the bridge across Red River in order to obtain the International Highway from Winnipeg to the Gulf, along the ninety-eighth meridian. After Mr. Williams, of Bowie, secretary of the movement in Texas, addressed the meeting funds were readily pledged and instructions were given Mr. Williams to employ an engineer to begin the preliminary work at once.

Prof. Arthur H. Blanchard Consulting Highway Engineer gave an illustrated lecture on "The Highways of Europe before members of the Society of the Municipal Engineers of the city of New York on February 26, 1913.



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GOOD ROADS NOTES IN BRIEF

Two districts in Spottsylvania county, Virginia—Berkley and Livingstone, have issued bonds for \$73,000 for road improvement.

The city of Waco, Texas, will spend \$100,000 more in street improvements. This sum was voted at an election held recently.

St. Petersburg, Florida, has contracted for the construction of eight miles of sidewalks.

Abilene, Texas, has contracted for the construction of 75,000 square yards of asphalt macadam pavement.

From Bluff City, Tennessee, comes the information that bids will be opened March 10 for the construction of 50 miles of good roads in Sullivan county.

Cleveland, Oklahoma, will spend \$40,000 in paving Broadway.

Noxubee county, Mississippi, will build 13 miles of gravel roads.

Cullman county, Alabama, will vote on \$300,000 of bonds March 10th.

Temple, Texas, is out for better streets and other modern improvements. Some time in April the city will vote on a bond issue of \$170,000 to build eight miles of streets.

Brooksville, Florida, is growing. Recently contract was awarded for \$19,950 of vitrified brick paving. It is estimated that this sum will pave 40,000 square yards of street in the business section.

The city of San Angelo, Texas, has contracted for 40,000 square yards of asphalt macadam on a concrete base.

The town of Sweetwater, Texas, will spend \$50,000 to pave with asphalt on a concrete base, 40,000 square yards of street.

The city of Abilene, Texas, will improve sixteen streets.

The Texas Motorway Company, of Dallas, Texas, will construct sixty miles of rock ballast road.

Report comes from Palacios, Texas, that Matagorda county will soon ask for bids on 300 miles of shell road.

San Benito, Texas, will lay six blocks of wood block paving on concrete base on Sam Houston Avenue.

Opelika, Alabama, will let contracts for the construction of 50,000 square yards of standard pavement.

The commissioners of Bartow county, Georgia, are considering issuing \$400,000 of bonds to build good roads.

W. S. FALLIS, WILSON, N. C.

Civil and Highway Engineer

Highway, Bridge and Sewer Construction. Street Paving and Water Works

CHARLES H. HOYT, C. E.

(Formerly U. S. Supt. of Road Construction and Bridge Engineer)

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BLASTING HARD GROUND INSTEAD OF USING PLOWS

THE use of explosives is steadily increasing as contractors learn of their time and labor-saving abilities. ¶ An example of the practical aid rendered by dynamite and the results obtained is shown in the report of our representative.

"The Los Angeles, California Park Department were given a demonstration of the use of dynamite to blast hard ground instead of plowing.

Thirty holes spaced four feet apart were bored six feet to desired grade, charged with two cartridges of dynamite and fired. The dirt was thoroughly loosened to grade and in excellent shape for quick and easy disposal by laborers.

Against the small cost of dynamiting is the saving of time, labor and strain on machinery and teams."

Red Cross Dynamite is adapted to the above class of work and its adoption means the accomplishment of more work in shorter time,—a feature appealing to modern road-builders.

For further information relative to the use of Du Pont Explosives for road making, address Department 289.

E. I. du Pont de Nemours Powder Co.

America's Pioneer Powder Makers

WILMINGTON, DELAWARE

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If you are a farmer, because your farm will increase in value, you can raise more profitable crops; your cost of hauling will be lower, you can market your products when prices are best your children can get to school, your family can attend church, your physician will be in closer touch with you, your boys and girls will stay on the farm, you will have better mail service more social life, and happier conditions all around.

If you are a merchant, because good roads enlarge your trading radius, and make it possible for purchasers to reach you every day in the year, and thereby increase your sales.

If you represent a chamber of commerce or a board of trade, because the public roads are commercial feeders to the city, and every improvement of these roads means a greater prosperity to the cities through increased agricultural production and greater stimulus to all industries.

If you are a highway official, because you are striving for better methods of road construction and maintenance, and more efficient road administration.

If you are a railroad man because improved roads mean greater production consequently more traffic prevent freight congestion bring more industries, more roads, more tourists.

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Studebaker Municipal Vehicles are in use in thousands of cities and towns in this and other countries.

This popularity is merited because they are built right, look right, run right, wear right and are right. The universal demand for them is proof conclusive of their superiority.

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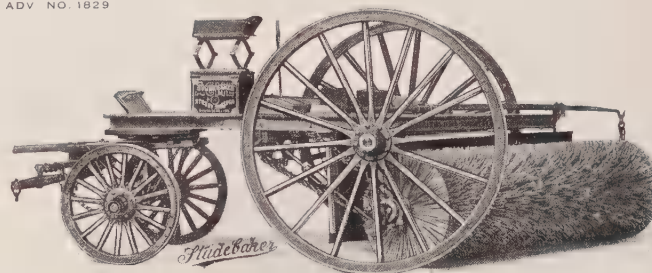
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SEWER PIPE**

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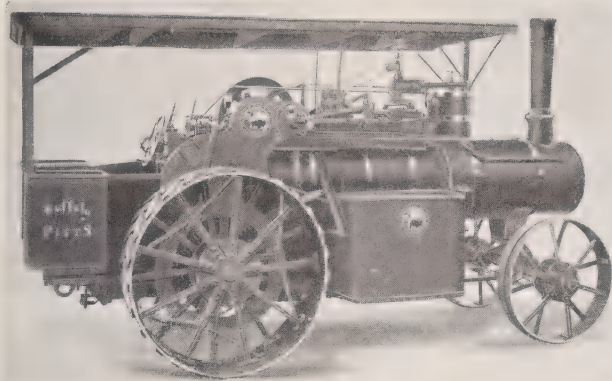
VITRIFIED TERRA - COTTA PIPE
for Road Culverts---Not only the BEST, but the CHEAPEST. Why pay one to three hundred per cent more and get less value? Hard burnt vitrified shale rock pipe *cannot* disintegrate. Has any other culvert been tried long enough to prove that fact?

Our new shale Pipe is unsurpassed in quality and strength. It is used exclusively by North Carolina Counties where highway improvement has long been under way. Prices on application.

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Annual capacity 1900 Cars

More Haulage Efficiency



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Engine Two sizes: 20 H. P., Brake Test 70 H. P.; and 26 H. P. Brake Test 100 H. P. Two road speeds, solid engine base, no strain on boiler.

Gearing Every gear genuine open-hearth steel, warranted never to break. Enclosed in case to keep out dust and mud.

Boiler Special high pressure complies with every state or county law. Working steam capacity 200 lbs.

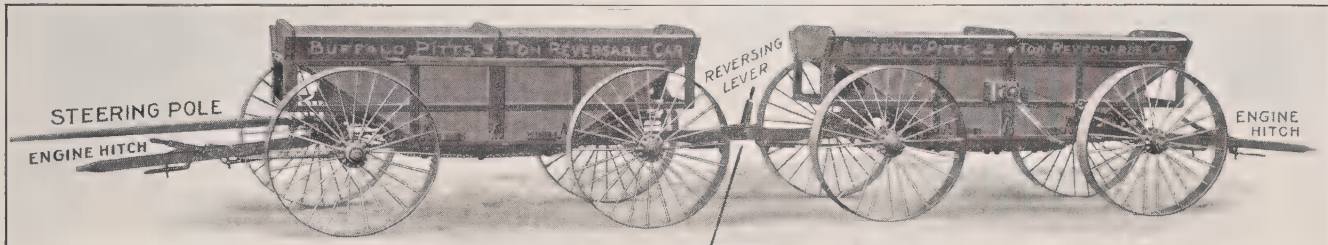
Axles High test drop forged.

Traction Mounting is so constructed on boiler extension that not a single bolt enters the water part of the boiler.

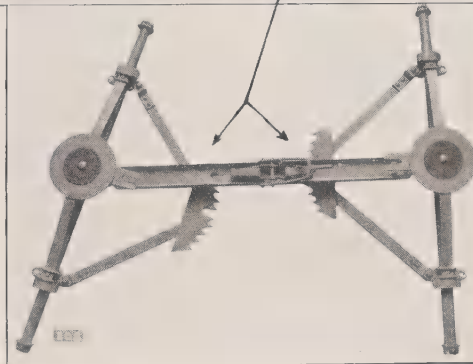
Traction Wheels Extra heavy steel with cleats that pull without cutting up finished road. Cleats tapered on inner edge to fit crown of road. Cleats are removable so the engine can be used for rolling if desired.

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A road car to be efficient must not only follow the tread of the locomotive accurately, but there must be a minimum of lost motion and ability to run forward or backward as desired.



The only Patent Reversible Gear of its kind. Makes this car efficient in place where others are useless. The lever throws either turning into bearing and locks the other so that cars will drive forward or back at will.

3½ yd. Patent Reversible Stone Spreading Car, 5 ton size. Forged steel frame, steel wheels and axles. Flat body with adjustable sides for brick, cement, etc., 54 inch wheels with 8 inch tires.

6½ to 8 yds. 10 Ton Size with same features of construction as described in 5 ton size.

6 Ton Convertible Freight Car equipped with different bodies for brick, cement, asphaltum, oil in barrels, pipe, timbers or any kind of material.

All types of BUFFALO PITTS CO. cars can be coupled in the same train

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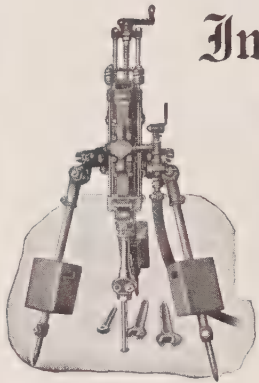
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That's the reason Wood Drills outlast others—do more work in less time—and do it better.

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Road Machine "Biggest Little Grader on Earth."



This is the most efficient one man machine on the market that is strong enough for 6 horses. Has no equal for leveling, cutting ditches for drainage, grading roads, etc. All steel, full sized blade, 7 ft 3 in. long, 16 in. wide, removable cutting edge, equipped with flanged wheels to avoid skidding and side draft, arched beam, no clogging. Sand proof hubs. Weight 850 lbs. Get our Catalogue.

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The Premier Carrier of the South

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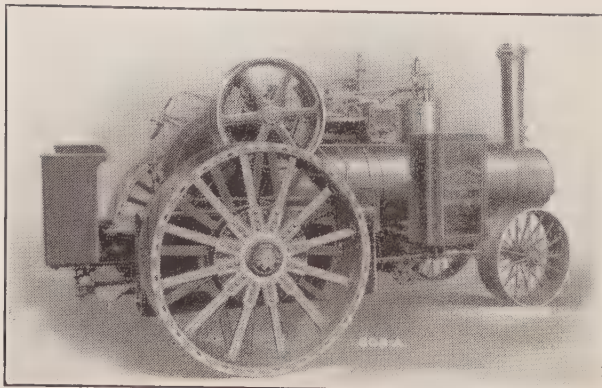
Identified as it is with the Southeastern Section of the United States, it is the purpose of the management of the Southern Railway Company to make its policies as helpful as may be practicable to the people of that Section.

Through its Land and Industrial Department and its Department of Farm improvement Work it co-operates with the communities along its lines for the location of Industries and of desirable classes of Farm Settlers and employs expert agents to co-operate with farmers seeking their advice as to improved farm methods, including diversification of crops, the building up of soil productivity, live stock raising and dairying. It has awarded scholarships in the State Agricultural Colleges of the States traversed by its lines to young men who would otherwise have been unable to avail themselves of an agricultural education. Realizing that the farmer who takes up the growing of new crops or the raising of live stock may be discouraged in his first season by the failure to market his products satisfactorily the Company has appointed market agents to give such information relative to markets, methods of packing, shipping, etc., as may be helpful to producers seeking their co-operation.

All of the co-operative development work of the Southern Railway Company is free to all persons in the territory traversed by its lines who may wish to avail themselves of it.

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M. V. RICHARDS, Land and Industrial Agent
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Team hauling costs 26 cents per yard per mile.
 Frick steam engine hauling costs 7 cents per yard per mile.
 The team is uncertain, of limited capacity and endurance.
 The Frick hauling engine is ready for constant service throughout either a 10, 20, 24 hour day.

No cost for maintenance when not working.
 Hauls over any finished road without damage.
 Inquire about our Patent Fill Price on Driver.

Let us quote prices on an engine suitable for your work.

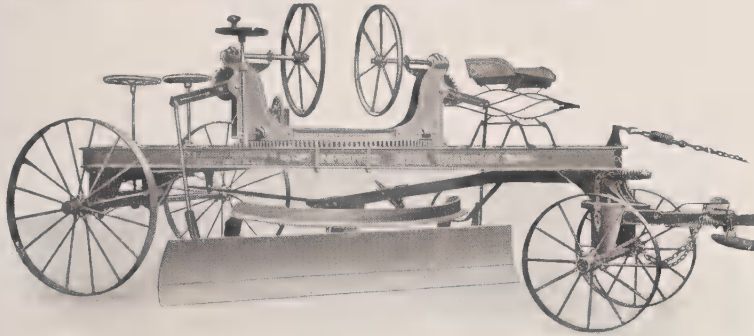
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The Improved Steel Champion Reversible Road Machine

We offer a two-horse, four-horse, or six horse road machine, or a machine to be drawn with steam or gasoline power.

Our Portable Crushing Outfit is convenient for use by county or contractor. Made in a number of sizes.

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THE GOOD ROADS MACHINERY COMPANY

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Steam Rollers, Tandem and Macadam
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Rock Crushers, Portable and Stationary
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Wheel and Drag Scrapers
Cast Iron and Corrugated Culvert Pipe



Champion Crusher, Elevator, Screen and Bin

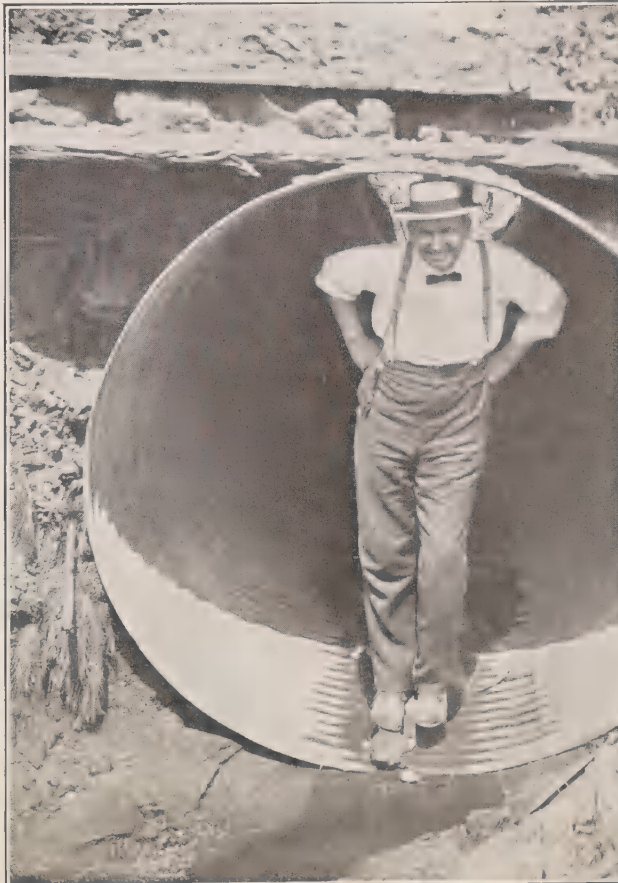
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You know that those are the four qualities your car must have; the Mitchell has them and many others that you will like.

The power and efficiency come from the new Mitchell T-head motor with the real long stroke---six and seven inches.

The reliability is guaranteed by the high standards maintained through 78 years of vehicle building. You have learned what the Mitchell name means---the best of workmanship and materials.

The unequalled convenience of the Mitchell automobile is due to the left hand drive with center control, the electric starter and the electric lighting system.

Comfort is assured by the extra long wheel base, the deep upholstery and the French Belaise springs.

All 1913 Mitchell cars have left drive and center control; Bosch ignition; Rayfield carburetor; Firestone demountable rims; rain-vision windshield; Jones speedometer; silk mohair top with dust cover; Turkish upholstered cushions; Timken front axle bearings; gauges on the dash to show air pressure and oil pressure; gauge in gasoline tank showing amount of gasoline it contains; and a portable electric lamp which also illuminates the instruments on the dash.

All with T-head motor, electric self-starter, electric lighting system, and 36-inch wheels

	Motor	Wheel Base	Price F. O. B. Racine
7 passenger Six	60 H. P. 4 1/4 x 7 in.	144 in.	\$2,500
2 or 5 passenger Six	50 H. P. 4 x 6 in.	132 in.	1,850
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You control the factor which determines the amount of your profit. What is this element? It is the efficiency of your equipment.

If your machinery does not do the best work in the shortest time at the least cost you are losing money, by wasting time and labor. Maximum dividends are yours if you use CASE Road Machinery.

CASE Road-Building Machinery has proved its ability under all conceivable conditions. Contractors and Road Builders are its staunchest friends. They are using it with the greatest possible success and profit.

CASE Machines meet all requirements of modern road construction and maintenance. They are of the heavy duty type---built to stand up under the severest service.

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Hauling with CASE Municipal Tractor, Pigeon, Mich.

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FOR
Earth Handling Rock Crushing Road Making



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The Austin Grader preparing the road bed

The Austin Motor Roller furnishing power for

The Aurora Steel Rock Crusher equipped with

The Aurora Elevators, Screens and Stone Bin

The Austin and Western Dump Wagons distributing stone for

The Austin Motor Road Roller to consolidate and

The Austin Sprinkler to form the binder

Supplemented by our line of elevating graders, wheel and drag scrapers, road plows, scarifiers, etc., our outfit insures to the Road Builder harmony, efficiency and economy in every step of road construction.

Sold and fully guaranteed direct from Makers to the Users.

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SOUTHERN GOOD ROADS

Vol. VII. No. 4.

Lexington, N. C., April, 1913

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Tarvia
*Preserves Roads
Prevents Dust*

Cambridge's Experience With Tarvia

CAMBRIDGE, MASS., is another Tarvia town. Many of its roads have been built during the last five years with "Tarvia X" or treated with "Tarvia B." The streets of Cambridge carry an enormous automobile traffic and the problem of maintaining adequate road surfaces was a serious one.

During 1912 eight of the leading thoroughfares which had been built with "Tarvia X" received surface treatments with "Tarvia B" at a cost of 2½c. per square yard.

The Superintendent of Streets of Cambridge reports, "This treatment not only preserves the surface of the

road from raveling, but renders the street dustless to a large extent. It has been found to be the most economical way to care for tar bound macadam."

In later years it will be found that additional annual treatment with "Tarvia B" will cost less each year. Westfield, N. J., for instance, found that roads which had been built with Tarvia, cost as little as 1¼c. per yard per year to maintain with "Tarvia B."

Towns which experiment with Tarvia get the habit and in time settle down to its use as a matter of consistent policy. By this means they reduce their road costs and at the same time give greater satisfaction to the citizens.

Tarvia is a special combination of refined tars especially prepared for road use. It forms a tough, plastic matrix about the stone and prevents erosion and attrition. It is not a palliative but a cure. It does not suppress dust so much as prevent the attrition which creates dust.

Booklet on request.

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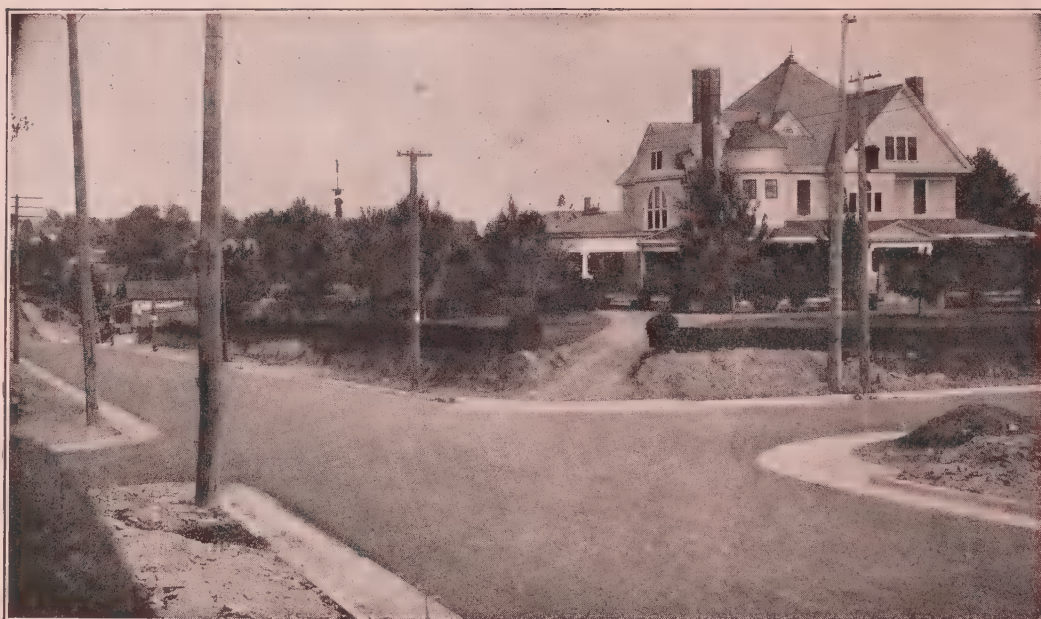
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River Parkway, Cambridge, Mass.

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Morehead Ave. and Duke Street, Durham, N. C. Treated With Standard Asphalt Macadam Binder

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These products are absolutely pure, containing 99 per cent. bitumen, and can be manufactured to any consistency desired. The three grades "A," "B" and "C" will be found to solve all problems of road surfacing or road construction that are ordinarily met with.

BINDER "A." A semi-solid product to be applied hot over stone or gravel roads subjected to heavy automobile travel. A covering of sand or screenings is necessary after Binder "A" is applied.

BINDERS "B" AND "C." Solid products used for road construction under the penetration or mixing methods—many hundreds of miles of roads in all sections of the country speak for the uniform success of these products of producing **DUSTLESS, PERMANENT ROADS.** BINDER "C" is slightly harder than BINDER "B" and is used in sections subjected to long continued heat.

Standard Asphalt Road Oils

STANDARD ASPHALT ROAD OILS are made with varying percentages of asphalt, from the lightest, containing 30 per cent asphalt, to the heaviest, containing 60 per cent. asphalt. Used under all conditions necessitating freedom from dust and protection of surface.

A full description of our various products, together with specifications for their correct use, is given in our illustrated Booklet. This will be sent free upon request.

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Through its Land and Industrial Department and its Department of Farm improvement Work it co-operates with the communities along its lines for the location of Industries and of desirable classes of Farm Settlers and employs expert agents to co-operate with farmers seeking their advice as to improved farm methods, including diversification of crops, the building up of soil productivity, live stock raising and dairying. It has awarded scholarships in the State Agricultural Colleges of the States traversed by its lines to young men who would otherwise have been unable to avail themselves of an agricultural education. Realizing that the farmer who takes up the growing of new crops or the raising of live stock may be discouraged in his first season by the failure to market his products satisfactorily the Company has appointed market agents to give such information relative to markets, methods of packing, shipping, etc., as may be helpful to producers seeking their co-operation.

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M. V. RICHARDS, Land and Industrial Agent
Washington, D. C.

72 Inches in Diameter

Our customers say our Corrugated Metal Culverts are constructed with more care than any others they have ever used.

Naturally we believe what they say is true.



**HARRY BROS.
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However, should you not be convinced by what we tell you let us ship a sample length or two, that you may inspect them to your own satisfaction.



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NEW ORLEANS, LA.**



RED CROSS DYNAMITE

Especially Adapted to Road Construction

Grading is easily and cheaply done by loading bore holes at proper depth with Red Cross Dynamite. The explosion shatters masses of earth. Its removal by shovel or scraper is made easy and economical.

Red Cross Dynamite is particularly efficient in cool weather. This brand is a "low freezing" dynamite and retains its sensitiveness when other explosives would necessitate thawing.

For further information address Dept. 289.

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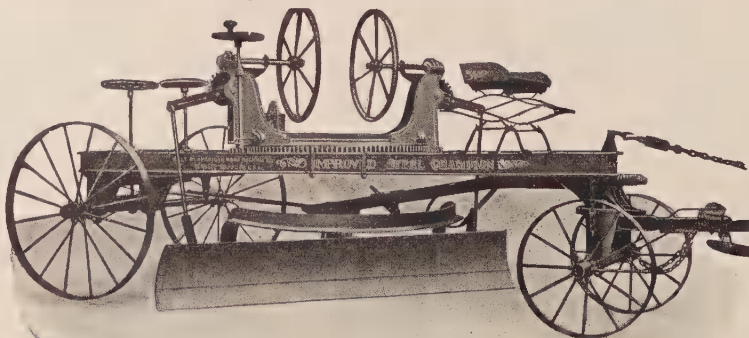
Pioneer Powder Makers of America

Established 1802

Wilmington, Del.

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We sell the most complete line of machinery and appliances for building and maintaining roads and streets that can be found anywhere in the world to-day. Our goods are high in quality, reasonable in cost. They are backed by thirty-five years practical experience. Anything you may want from a shovel to a steam roller we can supply. Pick out what you want from the following list and write us for information:



The Improved Steel Champion Reversible Road Machine

We offer a two-horse, four-horse, or six horse road machine, or a machine to be drawn with steam or gasoline power.

Our Portable Crushing Outfit is convenient for use by county or contractor. Made in a number of sizes.

Catalogues are free. It will place you under no obligation to ask for prices and printed matter.

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Steam Rollers, Tandem and Macadam
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Wheel and Drag Scrapers
Cast Iron and Corrugated Culvert Pipe



Champion Crusher, Elevator, Screen and Bin

SOUTHERN GOOD ROADS

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By Southern Good Roads Publishing Co.

Lexington, N. C., April, 1913

Entered at Lexington Post Office as
second class matter

"365-Day Roads"

By J. D. CLARKSON

President "365-Day Road Club," Carthage, Missouri

MY EXCUSE, if excuse is necessary, for the article offered is that the road movement of the present day spells as much, if not more for the development of our country, as the railroad building era of a quarter of a century ago.

In selecting for discussion the subject "365 Day Roads," two divergent ideas are presented.

In one sense, and in many localities, a 365 Day Road is a condition—it is the same old road we travel over day after day—365 days in the year, until the rocks and the chuck holes have become land marks, each with its tale of suffering and destruction for the passerby.

In another sense, and in many localities, the 365 Day Road has become an aspiration—a thing hoped for—the same old road, but with amendments—some rocks have been taken out here, some chuck holes filled up there, and a glimmer of hope appears on the horizon, that possibly some day it will be a good road.

The term 365 Day Road means the best possible road that can be built with the money, material and people at command, and the people is the largest ingredient. The road man of the future is the man who recognizes that it takes people to make a road. The technical expert will talk learnedly and well of how to treat certain materials so as to get a good road bed and surface, but we hear very little of how to treat people, so as to get them to combine into good road making material, and the secret of success of the road builders of the future is in the treatment of the people, so that they will combine into a force much more potent than the chemical and material constituents it takes to make a road. Combine the people, and the money and material will be found in abundant supply.

In some localities the term "365 Day Road" has been substituted for "good," and not only becomes a definition, but also a reality.

As a definition, it means a road with a width, grade, and surface that will permit the use of all kinds of vehicles, likely to use the road, to be used with maximum loads, at maximum speed, and to pass each other with comfort and safety for the occupants, 365 days in the year.

It will be noted at a glance that the definition does not mean an oiled road, or a dirt road, but it does mean a road adapted to all kinds and volume of traffic, that may reasonably be expected or induced to pass over it. This definition of a good road, if properly understood,

brings us to the very heart and essence of this discussion, viz: The best possible road than can be made with the material, money, and people at hand, available for the purpose.

A road with the brush and weeds growing up to the wheel tracks is "good" to the young fellow in a rubber tire buggy, taking his girl riding of a Sunday evening, but the same road is not very good to the same young fellow, when a few months later, he has discarded his horse and buggy, bought an automobile, and is giving this same girl her first lesson in guiding the auto.

The term good, as applied to public roads, has heretofore possessed different meanings to different people. Some farmers may call a road good, over and through which he can make his way to his market town with twenty-five bushels of corn, or a ton of hay, with bridge and culvert approaches in such condition that they almost stall the team to pull onto them, or break an axle in getting off, but the automobile man does not use the term "good," nor what is commonly accepted as a "good" term in describing such a road. He uses other terms and expressions that resemble in form and intensity the explosion of a single cylinder engine, with the mufflers cut out.

In many localities the road man has taken lessons from the seventeen year locust—like the locust he has periods of excessive activity when he piles up dirt and rock and gravel in the middle of the road in such quantities, and in such a manner that the passerby must take to the ditch for months, and sometimes for years. The ant would be a better instructor—let him learn of her ways, and be wise. Disturb an ant hill, and see how quickly repairs are commenced.

The men who are going to build and maintain 365 Day Roads must be fully as prompt with repairs as is the ant. Without the addition of one yard of new material, thousands of miles of roads could be wonderfully improved by a simple rearrangement of the material now on the roadway, and the judicious and honest use of the money now at command.

It means a three track road near large towns, narrowing down to two track roads, as the traffic divides, and to one track roads in more sparsely settled neighborhoods, but always constructed in such a manner as to give room for the safe passing of vehicles, even on the least traveled roads.

It means a rock road, in a locality having the mater-

ial, money, and traffic to justify it, or a graveled road, or an oiled road, or just a plain every-day dirt road. In short, a 365 Day Road means the best possible road that can be made and maintained for the money and material at command, adapted to the requirements of



One of the double drags made by the "365-Day Road Club" of Carthage, Missouri. Their road-dragging system is the wonder of road builders throughout the country.

the traffic of the locality, always taking into consideration the fact that more traffic can be had for the asking.

So organize and construct the road work, as to enlist interest in the men doing the work.

Communities must be organized and instructed, so as to express themselves economically.

To use medical terms, the time has come to abandon the old "Absent Treatment" way of caring for our roads, and substitute "massage" in place of it.

For years, thoughtless people have labored under the impression that a good place to put surplus rocks was in the middle of the road, if covered with a little dirt or gravel, seemingly oblivious of the fact that any loose rock in the roadway, the center of which is above the frost line, will quietly, persistently, and later, very obtrusively come to the surface. Miles and miles of roadway are now in a deplorable condition, because the people who built them forget that "Jack Frost" is a mighty busy fellow, and may be found any cold day or night prying up the rocks with millions of levers,

and every rain storm assists him in his work by washing the covering from the elevated surface.

The chemist in his laboratory spends hours and days, and sometimes years with a mass of chemical elements and ingredients, and notwithstanding his most strenuous thought and exertion, the mass lies impotent before him. Signs of life and activity are noticeable at intervals, but the desired results do not come. A less determined man might turn away in hopeless despondency, but not he. Another ingredient is added, and behold the impotent mass is in action, irresistible action. Another of Nature's secrets has been discovered and devoted to the use of man. For years our road chemists have been laboring in Nature's laboratory, adding something here, taking out something there; the mass has at times, and in some places, shown signs of activity, some spots have appeared on the surface that gave hope of success; but is it not apparent to all that the great mass of the roads of the United States lie impotent, as they were. What is the lacking ingredient that will stir things into irresistible action? The continuously strung bow loses its elasticity. Sometimes it is well, after having worked and thought for a long time over a problem, to turn away and forget it for a while—giving attention to entirely different matters, so as to relieve the mind of tension.

For a brief space let us turn away from the physical problems of road building that we have been moiling over, and wending our way to the brookside, seat ourselves under the spreading elm and wonder how it came about that Nature ever made so beautiful a creation as the crystal stream that flows at our feet, laughing as it ripples over its gravel bed, and splashing over the obstructions in its path, and learn our lessons there.

Then let's penetrate farther into the heart of Nature, and passing through the balsam forest, proceed to the very topmost pinnacle of the mountain; after having filled our lungs with the pure ozone of the mountain top, let us glance around, and with cleared vision, analyze what we see spread out before us.



Portable crusher at work under the direction of the "365-Day Road Club" at Carthage, Missouri. The maximum of efficiency is what the club aims at and this shows how they get it. The rock is hauled to the crusher on the road and the crusher is hauled forward after each 15 feet of road is covered, thereby saving one haul of rock.

On one hand are the rugged billows of the mountain range, beautiful to look upon, as Nature made them.

On the other hand lies the valley far below, equally beautiful to look upon—as Nature made it, improved by the hand of man. Notice the houses and barns, the fields, flowers, and growing crops, the railroads, and the public highways, as they stretch like ribbons through the verdure of the fields.

Then like a flash our vision is cleared, and we have



A stretch of finished macadam in the outskirts of Carthage, Missouri, a city made famous by one of the liveliest good roads organizations in the country, the "365-Day Road Club"

discovered the missing ingredient in our road problem—it is the human element.

We have been trying to build roads with stone and gravel and sand, asphalt and oil and plain dirt, and the mass lies before us, showing little signs of life and activity—impotent. Is it not time to introduce the human element in that practical form to which the American people so quickly respond?

How often have we seen the dull pupil respond to the skillful appeal of the teacher, when the human element was introduced.

Call it by the old fashioned name "Horse Sense," the new fashioned name "Psychology," or any intermediate name that expresses the thought of men's minds in harmonious and irresistible action.

In appealing for the construction of 365 day roads we have in mind the best interest of the people now on earth. The rock road, the gravel road, and the oil road are good enough as specialties, but the roads over which the people now on earth must travel for some time to come, are the dirt roads. Suppose the general government could be induced to extend its paternalism over the road system of the United States, and pledge billions of dollars for immediate rock road construction, are we so educated or organized in road building, as to be able to use the money effectively, economically, and honestly?

The federal government is probably not going to give us billions with which to build roads, and if it did, we would be the real donors, and the government only our treasurer. So let us waste no further time looking with longing eyes on the treasure vaults at Washington, but fix our gaze nearer home, while the specialists in rock and gravel and oil construction proceed with their very important researches, discoveries, and applications, well serving the communities that have the money and traffic to justify it; but the great body of roads for years to come must be made of the dirt that lies along the roadside. So let us plunge into this problem with the genius and enthusiasm so char-

acteristic of the American people. That is the one element yet lacking in our road work, the human element. It was this that wiped the great American desert off the face of the map.

Dry farming, farming without water, how preposterous! And yet it is an accomplished fact, and so recently, that on thousands of farms in that district the old black sod house stands close by the new two story white painted home of the pioneer. Do they farm without water? No! They conserve the water in the soil. They use the material at hand. W. H. Campbell, the man who more than any other is responsible for the success of dry farming—by thought and experiment, discovered a treatment of the soil which would permit the scant moisture which Nature deposited in it to come out only through the roots of the plants, and when he solved that problem, he—possibly unthoughtedly—and is probably yet, unconscious of the fact that he has solved the problem of the successful construction of dirt roads, as the successful dirt road is the process of dry farming, and the material used to make a dry farm—reversed. But even he—with all his genius would not have been able to transform the Great American Desert into the granary of the world had not chance introduced this human element we are discussing, into his problem.

There is a certain halo of romance attaching to all large transactions—without it, the Hudson river tunnels would yet be but a hole in the ground, and the Panama Canal would still be only a pile of rock and dirt, but the very magnitude of these transactions cover their disagreeable and difficult features as with a veil, and appeal to the imagination of the people. The daily toil and tribulation is unseen and unnoticed, while their eyes are fixed on the distant goal.

Chance or Providence so timed Campbell's discoveries as to fit in with the developments in improved farm machinery, and the flat western prairies were well adapted by Nature for the activities of the traction engine. The idea of farming sections instead of

acres appealed by its very magnitude to the imagination of our people and millions of bushels of wheat were made to grow where nothing but "short grass," prairies dogs, and jack rabbits had ever been seen before. The human element had been introduced.

No interest attaches to the spectacle of a man working on a mile road with team and scraper, piling up dirt on the roadway; but combine a hundred and fifty miles of road in one proposition, as we did in projecting a road from Carthage, Mo., to Kansas City, and at once that most potent influence in human affairs, emulation, attaches to the enterprise, and the man with the scraper becomes a part of a living chain of human units—emulation comes in to play its part and the daily toil becomes a game—fatigue takes flight, and the stationary figure of the eagle on the dollar is invested with a new meaning—becoming a winged messenger to collect and carry funds for the completion of each enterprise. Here let us learn a lesson from the story of Pygmalion—mythological though it be—let us invest our enterprises with human interest, and give them such an intensity of thought that the cold and lifeless material will turn to a warm and throbbing form under our touch, instinct with life.

The 365 Day Road Club of Missouri is a modern exemplification of this ancient fable. The same thing can be done in thousands of other communities.

If I had the time, and the space, I would like very much to tell, in detail, how the application of this principle worked out in our locality, when applied to our conditions.

The 365 Day Road Club is convinced that the successful road builder is the man who can build roads out of the material at hand, and not the man who wastes his time pining for the fine road material he knows of in other localities, but the use of which is prohibited by excessive cost of transportation.

The Club's success in road building and maintenance lies in its ability to make good roads out of the material at hand. This was glaringly illustrated in its own

home county, Jasper county, Mo. No locality possesses better material for the construction of roads, but owing to the inexpert and careless use of these materials, Carthage suffered from poorly constructed and badly maintained roads.

The 365 Day Road Club, in many cases, has taken a stretch of road and without adding one load of new material, made a road, over which the farmer can trot his team with a 4,000 lb. load, and the autoist can break the speed limit, without jarring his springs.

In other localities, where the ground was so full of rocks that it was deemed inexpedient to make a road at all, the Club has adapted itself to the situation, and without removing or adding a wagon load of material, has made one of the best miles of double track road in the county, at such a low cost, that experts are astounded. Some of these roads have been "nightmares" for years. The club is changing all this. The "nightmares" have changed to "dreams."

Miles and miles of roads have been treated and made into good roads without adding one yard of new material.

The process was simple, and consisted only in rearranging the material already on the roadway.

Most bad roads result from good road material wrongly arranged.

Make it an honor to belong, to be a part of, the road making organization, and it will be a matter of surprise how the people will rally to its support.

The very men who handle the raw material along the roadside will catch the spirit—fatigue will take flight, and their work become a game.

Make an art of road building by striving to make each additional mile of road better than the last.

Strive to give the people bargains in roads, and they will respond with more money with which to buy more roads, and thus reward the laborer with more continuous employment for his added interest. Put the people in our problem.



A finished rock road near Carthage, Missouri, after it has been filled with dirt and rolled.
It is one of the 365-day variety

Bituminous Materials For Road Building

By ALLERTON S. CUSHMAN, Ph. D.

WITHIN recent years and coincidentally with the development of motor driven traffic, the necessity and demand for bituminous binders in road construction has placed upon the highway engineer and contractor a new and heavy responsibility. At the very beginning of this modern phase in road building, the laboratory chemist as well as the chemical engineer were called upon to go into partnership with the construction engineer in the effort to solve the modern road problem. It is fair to state that in the beginning of the movement the call made upon the chemist found him quite unprepared for the task in hand, for not only were the useful characteristics and qualities of bituminous substances to be used in road construction unknown, but also laboratory methods of testing and analysis either did not exist at all or were unstandardized and chaotic. In addition to this difficulty a number of years had to pass and many expensive failures encountered before construction engineers became convinced that the aid of properly trained chemist was essential to his success.

The time is not long past, even if it is quite gone yet, when bituminous binders were considered to be sufficiently well covered by specification if they were black enough, sticky enough and smelled bad enough. Under such a method of purchase, the price per gallon is the controlling item in the specification, and the cheapest material is considered the best. As a matter of fact, probably no materials of construction ever offered to engineers differ more widely in properties than do the various bituminous road binders. Steel, cement, brick

and other materials of construction also vary widely in their useful properties, but they have been in use so long and the problems of their examination and testing have been so thoroughly threshed out between producer and consumer, that no one need be in doubt about the standard specifications under which purchase is made. Out of the chaos from which bituminous road binders have evolved, we may now look forward with a fair amount of confidence to the not distant future when an engineer can specify his material with a view to the qualities he requires to meet his especial climatic, constructional and traffic conditions. At the same time the producer will find himself able to meet the specification not alone with one carload of material but will be able to ensure an even grade of product. Many of us who have had experience know that under one brand or trade name, succeeding shipments of material have resembled each other in blackness and smelliness but in little else beside.

The problems of road binders are complicated by many factors. To begin with their source of type, we find them roughly divided into three main classes: (1) native asphalts usually fluxed with a residual oil; (2) petroleum oil residuums; (3) tars and tar products. The chemist has been called upon to study all these types which usually resemble each other in blackness and stickiness but in little else beside. It is the opinion of the writer that all these types are good and useful road materials when properly prepared and selected to suit given conditions. In one case one type may be better suited than the others, while in another the



On This Fine Section of the Beech Bluff Road, Near Jackson, Tennessee, a Medium Grade of Oil Was Used as a Road Preservative and Dust Preventive, With Satisfactory Results



A Disgracefully Bad Piece of Road, Three Miles From New Decatur, Alabama. The Road is a Disgrace to Morgan County

selection may be made from either with due and wise reference to comparative costs. No greater mistake can be made, however, than to buy only with reference to first costs, and this applies not alone to road problems but to everything else in which humanity is interested. Now the chemist may feel that the work he has done in the last ten years has made him so familiar with these main types of bituminous binders that he is prepared to undertake their examination and to report upon them with considerable confidence. When, however, the manufacturer elects to mix two or even three of these different kinds of material into one black mass, the poor chemist has his troubles, and the trouble is that no one realizes them or wants to pay him adequately for wading through the difficulty.

There is another point I would bring to your attention. The same kind of steel, cement and bricks which give good service in the north are equally good in the south, but a bituminous binder which is well adapted to a temperate climate may be quite unfit for use under tropical or semi-tropical conditions. Again a material well suited to stand the winter climate may sweat and bleed in summer, and a good summer material may crack and go to pieces in winter.

While I wish to point out the difficulties that attend the proper selection of bituminous road materials, I do not desire to give the impression that the subject is a hopeless one. Already great advances have been made in the methods of testing, and engineers can confidently depend upon the trained chemist not only to aid him in drawing specifications but also to insure him that deliveries are standard and in accordance with specifications as drawn.

All are not chemists and I am not going to bore you with an account of how we test bitumens in the laboratory. There are standard books and pamphlets of

recent date, which go into such matters in detail and to which any interested person can refer. I may, however, be permitted to classify briefly under two headings the chief characteristics sought and which must determine the engineer as well as the chemist in the selection or judgment of a given material. I group these qualities somewhat arbitrarily under the heads physical and chemical. Under physical, we must determine the following factors: Specific Gravity, Viscosity, Penetration at 32 degrees, 77 degrees or 115 degrees C., Volatilization at 163 degrees C., Melting or flow point, Flash and Burning Point, Ductility. Under chemical tests, we may group: Total Bitumen Soluble in Carbon Disulphide, Bitumen Insoluble in 86 degrees B. Naphthavitumen insoluble in carbon tetrachloride, Fixed Carbon, Free Carbon, Distillation Test, Determination and Investigation of Ash. In addition to the above tests, the chemist is called upon to consider the extraction of bituminous aggregates, the grading of the mineral aggregate and the determination of voids in the mineral aggregate.

In some cases, in which native asphalts are in question, the determination of the ash will indicate what material has been used, and more than once this simple test has been called upon to settle important matters under dispute.

No highway engineer who fails to avail himself of the information acquired by the skilled bitumen chemist can ever be quite certain of duplicating successful work or of avoiding the repetition of previous failure. Without such assistance, the data which the engineer is continually accumulating and which, together with his engineering experience, measures his efficiency, must be ragged and incomplete. In the laboratories which I have the honor to direct, the effort is made to co-operate with the engineer to the end that the work done shall

be promptly and practically useful. We all know of cases in which bituminous material has been built into road construction, that never would have been allowed to enter, had the laboratory information been available in time if not in advance. It has been with a view to meeting this situation and seeking the co-operation of the producer as well as the consumer, that we have ventured to suggest a tentative plan which would enable the engineer or contractor to purchase material to a certified test and analysis. The cost of such a plan constitutes but a very small charge on the bulk cost. There is not space here to explain this plan in detail, but after giving the matter very careful thought we have reached the conclusion that some such system as

we propose must be worked out for the protection of the manufacturer who is prepared to deliver material within specification, as well as for the consumer who has not the time and in some cases lacks the expert knowledge to follow up and interpret bituminous specifications.

In conclusion, I may say that in this brief paper the effort has not been made to give detailed information in regard to the useful qualities of bituminous binders but rather to survey the situation in a very general way. If I have succeeded ever so little in emphasizing to modern road builders the importance of close co-operation with the chemist and chemical engineer, I shall have accomplished my purpose.

What the States Are Doing in Road Building

The Louisville Courier-Journal on the 25th. of March, carried an interesting but exceedingly pessimistic article on the good roads movement in Kentucky. The Courier-Journal sees but little progress in the road movement in Kentucky and is doubtful about the state highway commission, owing to that body's lack of power. The paper sums up admirably the situation in other states and points out defects in the Kentucky road laws, calling attention to the work of Secretary H. L. Ramsey, of the Louisville Automobile Club, who has written the governor of every state in the Union, asking him for information on good roads work in his commonwealth. Five questions were asked: Have you a Highway Commission? What is the amount expended by the state on good roads? How is it raised? How is it expended? Do you use convicts on road work?

This should be of interest to Kentucky because of the proposed constitutional amendment which will provide for the working of convicts on roads and on account of the general interest in the movement.

A resume of Secretary Ramsey's table shows that twenty-six states have a Road Commission or Board of Control. Twenty-two states have none, the road building and maintenance being left to county or township supervisors.

A statement of expenditures shows:

States spending annually \$1,000,000 or more: California, Connecticut, Massachusetts, New York, Ohio, Iowa, Oregon, Pennsylvania, Washington.

States spending \$500,000 to \$1,000,000: Maine, Maryland, Oklahoma, New Jersey.

States spending annually \$100,000 to \$500,000: Alabama, Arizona, Colorado, Illinois, Michigan, Minnesota, Missouri, New Hampshire, New Mexico, Rhode Island, South Carolina, Utah, Virginia, Wisconsin.

States spending less than \$100,000: Idaho, Kentucky, Nevada, North Carolina.

States spending nothing: Arkansas, Indiana, Mississippi, Montana, Texas, Wyoming, West Virginia.

States not reported: Delaware, Florida, Georgia, Kansas, Louisiana, Nebraska, North Dakota, South Dakota, Tennessee, Vermont.

In fourteen states all money appropriated for road purposes is from the general tax fund. In four states this is supplemented by the Automobile License Fund and in one, Kentucky, the entire money spent by the state is from automobile licenses. Nine states either raise the entire road fund by the sale of bonds or by bonds with additional appropriations. Two have a road poll tax of \$2 and three have a special road tax. In Colorado the road fund is secured by the sale of public lands.

In eighteen states the money is expended under the direct supervision of the State Highway Commission, in five states under state and county commissioners jointly and in two states the state commissioner acts merely in an advisory capacity and in one state by the State Geological Survey.

Nine states work or have laws permitting the work of all able-bodied convicts on public roads at the expense of the state. Two have laws allowing convicts to work under the authority of and at the expense of the County Road Commissioners. Two states use



This alluring bit of roadway is near Emporia, Virginia. It is a gravel road and was built by the county convict road gang. It makes you long to see what is "just beyond the bend."

convicts for crushing stone inside the prisons which is then shipped to counties free. Three states have laws allowing county convicts and short-term convicts to be worked on the roads of their home counties. Seven additional states report that they have been experimenting or have given their governor power to make experiments along this line.

"There seems to be strong sentiment in favor of convict labor on the part of all road authorities," said Secretary Ramsey, "and where it is has been tried it has proved very successful. In some states they are working large crews of convicts without guards, as in the case of Arizona."

Benton county, Tennessee, has joined the ranks of the progressive counties of the Volunteer State by voting \$200,000 of bonds for road building.

Our Road Problems in South Carolina

By M. GOODE HOLMES

Professor of Civil Engineering, University of South Carolina

A system of good roads is dependent upon three vital factors, and unless these three are recognized and given their mutual value we cannot hope to solve this problem of how we may obtain good roads. It is essential that a road be properly located, properly constructed, and properly maintained. These three are so closely related that a failure to recognize one of them usually means at least a partial failure of the entire road.

A roadway is a channel of communication or path for traffic, and as such it is essential that the location be such that it will give the most efficient service. Again a roadway is, or should be, a permanent investment; this requires that the location should be such that the cost of construction and maintenance shall be in keeping with the service rendered or the volume of traffic carried. The location of an ideal road should be such that the distances between the salient points are a minimum, the grades just sufficient to give proper drainage, and the roadway firm and solid. In most cases if all of these conditions are realized we make the road a very costly constructive problem, chiefly on account of excessive cuts and fills and costly drainage problems. The location must be so selected that the roadway shall be firm and the grades not excessive. In a hilly country this in most cases can be attained either by selecting a circuitous route, or by cutting and filling across the hills and depressions; the question being settled by balancing the cost of construction against the extra haul and the longer stretch of road to be maintained. When the location is such that the grades are excessive, the drainage poor, or the foundation unsuitable, any road that we may build is only a makeshift requiring constant renewing, and even then not giving efficient service.

Of equal importance it is that the road shall be properly constructed. No matter how good the location, unless the road is properly constructed, we waste the money invested in the road. A good location is of no value if the construction is poor; and poor construction as well as poor location always involves a great outlay to keep the road in fairly good condition. It is essential that the roadway be thoroughly drained and that all water be taken entirely from the right-of-way; that the fills be properly consolidated and free from material that will in time rot and cause a settlement; that the surface be of a homogeneous consistency in order that the road may wear uniformly; and that deep ditches be avoided wherever possible, as they are not only hard to maintain but also a great menace to traffic.

The lack of maintenance may be well said to be the great crime of the road authorities in South Carolina. A road, no matter how well located or constructed, if not properly maintained, will soon go to pieces. The cost of maintenance is directly dependent on proper location and construction; for instance, an excessive grade will cause the surface to wash into gullies, a boggy foundation will cause the bottom to drop out of the road; and faulty construction will cause the road to go to pieces in too many ways to mention.

We thus see that in order to get a system of good roads we have got to give due value to the questions of location, construction, and maintenance. In other words our road work must be put into the hands of men specially trained for this phase of engineering.

In South Carolina we have the possibilities of as fine a system of roads as can be constructed anywhere, and that too without the enormous outlay of money as in the case of so many Good Roads States; but it is going to take time and a great deal of money for this per-



A New Gravel Road Near Cheraw, South Carolina. A Few Months Ago This Stretch of Road Was One of the Worst in the State

fectured system to become a reality. In the meantime our road work must be so planned, executed, and maintained that every dollar spent shall not only relieve the present trouble, but shall be an integral investment in the final construction of a permanent road. Most of our roads today are a living proof that our old supervisor system, which has come down to us from the time of Queen Elizabeth, is a failure, though I must say that there are some brilliant exceptions to this rule. This system is tremendously expensive, and generally devoid of results, in that most of the money thus spent does not result in a single mile of really permanent road improvement. At the end of the year the roads are no better than they were the previous year, and we are generally fortunate if they are even as good in some cases. This condition will continue just so long as this system remains in force; and the first step forward is to abolish the system. The surest and quickest way to accomplish this is in the establishment of a non-political State Highway Commission, with expert resident road engineers in charge of the roads in each county.

Prof. W. H. Hand has drawn a comparison between four good roads states and four states which may fairly be called bad road states, and among this latter number is South Carolina. He finds that the average per cent of illiteracy in the first four states is only one third of one per cent while in the second four states, including South Carolina, the percentage is four and seventy six one-hundredths per cent. Again the records show that for the year ending June 30th, 1911, that South Carolina, or rather her counties, spent \$785,000 on her roads for that year; and it is a safe estimate to say that we did not realize more than 5 per cent of this amount in permanent road improvement. It is a crime to allow this money to be wasted in this way. Let us see for instance what could be done. With this amount of money we would build 200 miles of sand-clay roads at \$700 per mile; 100 miles of gravel roads at \$1600 per mile; and 40 miles of macadam roads at \$5000 per mile. This would take \$500,000, and give 340 miles per year of improved roads. Now spend an average of \$30 per year per mile on these 340 miles to maintain them, and we bring the amount up to \$510,200. After improving these 340 miles there will be left 41,490 miles of roads of all classes and descriptions. Intelligently expend an average of \$5 per year per mile on these 41,490 miles, which would keep them in far better condition than they are now kept and we raise the amount to \$717,650; leaving a balance of \$67,350, which could then be expended in properly designed short span bridges and culverts in the above mentioned 340 miles of improved roads. I do not mean to even suggest this scheme as the best method of using the above fund of \$785,000 but merely use it as an illustration of how, under proper administration and competent engineering, results could be obtained where they are now lacking.

Upon a careful study of our road question we are led to conclude that we have about twice as much mileage as we actually need; or if our roads were properly located 21,000 miles would be ample for our state. About 25 per cent. of this mileage will need to be made into what are termed permanent roads; the rest of the mileage should be made into good earth roads and properly maintained. Take the above system for instance, and it would take less than fifteen years to attain a system of good roads in this state.

Another force that we have to contend with in the solution of our road problem is the so-called road en-

thusiasts and supposed road authorities who claim that improved roads can be built and maintained for less than is actually the case. These people are real enemies of the cause of good roads. A system of good roads is a costly proposition, both as regards construction and maintenance; but at the same time they are a paying investment, as has been clearly demonstrated where we have improved roads.

The Good Roads of Antiquity.

In a recent issue the Youth's Companion reviews in a way that will be of interest to every reader of Southern Good Roads, road building among the ancients.

Savage man built nothing that can be called a road. When he was hungry he sought food in the forests, or in the streams and lakes, and finally made for himself definite trails. These trails became at last the first roads. Mr. L. W. Page, in "Roads, Paths and Bridges," tells of the stone-surfaced roads found in Egypt, built thousands of years ago, of massive stone blocks, in



This road is like many another road in Louisiana and elsewhere. It is under water the most of the time and bad always. Here the road follows the creek bed for some distance. It is known as the Ward Creek ford on the Greenwell road and is near Baton Rouge, La.

some places ten feet thick. It was over such a substantial road as this that the stones used in the construction of the great Pyramids were hauled.

Egypt is not the only land possessing relics of early road-building. Babylon, the city of hanging gardens and great walls, at a very early date developed a high state of civilization, and Semiramis, its great queen, was an enthusiastic road-builder. It is at this period that we find what is probably the first use of stone in bridge-building. The two portions of the city were joined by a bridge across the Euphrates. This wonderful bridge was built of large stone blocks, joined with plates of lead.

At that period, more than 2,000 years before Christ, asphalt was used instead of mortar in constructing the vast walls around the city. Commerce flourished, and great highways radiated to all the principal cities of the known world. It is said that a highway 400 miles long, paved with brick set in a mortar of asphaltum, connected Nineveh and Babylon.

It was left to the Carthaginians to become instructors to the world in the art of road-building. Carthage is given the credit of having demonstrated to the world the strategic and economic value of improved roads. But for a splendid system of highways, which permitted an easy means of communication with all parts of her domains, she never could have reached the heights she attained, either in commerce or war.

Notes on Water Bond Macadam

By JAMES OWEN

Consulting Engineer, Montclair, New Jersey

WITH the revolution of highway travel that has occurred in the last few years, the question of the methods of construction of highways is a matter of serious import. It must be remembered that the present status of the roads in this country is to a certain extent transient; we are in the constructive age and of course for many years such a condition will exist in a large portion of this country.

There are, however, even now localities where it may be said that the constructive age has passed, and where the maintenance question is proving the stumbling block. In regarding this maintenance question the question of good or bad construction, good or bad material or good or bad workmanship in the past is a matter of vital force, and the experience of these older communities with even limited periods of maintenance should be a guide for future practice in the constructive areas.

Then arises the question of ability to pay, and with the ability is coupled willingness on the part of the taxpayer. Given the road and ability to pay, then enters the question of locality, climate, topography, available material, classes of construction, with also probable permanency of the structure, taking into consideration the character of travel and cost of transportation. And further it must be remembered that road construction is not a business proposition, but political, subject to the changes and whims of those in office and to the caprice of the body politic.

Also, there is to be considered the factor of ignorance, at present, of those in charge of road construction due to the enormous expansion of the work and lack of available talent and the slow process of education.

Outlining the status of the road problem at present, what will be the general future practice at large in the vast sums that are about to be expended? Taking the crystallized practice of the oldest states for the past 20 years, as a rule the nearest available material was made use of. In a granite country, granite; in a trap country, trap, and where gravel abounded gravel was used. The data collected from such practice showed good results and good roads until the advent of the automobile when deterioration became rapid and other methods substituted. With this change in the character of travel the maintenance question was injected instantaneously. In older times a well constructed road would run along four, five or even ten years without consideration of repairs. Today all this is changed and the maintenance problem often commences before construction is ended.

Such a change in conditions would seemingly demand a change of practice, and such demand has been earnestly taken up by the talent of all countries, and so far, it may be said with no absolute success in a monetary view, and with uncertain success in actual practical results.

It must be recalled that before the demand for the change came, all highway construction as separated from city street practice, was of the water bond type. On account of expense demonstrated by the experience in those cities that had used a mastic or bituminous

material for a binder, the use of such binder had never been taken up or considered as a factor in rural or suburban thoroughfares. However, with the steadily increasing use and increasing wear of the old water bond macadam a demand for some other binder became insistent and the engineering brains and other kinds of brains ran riot in furnishing and providing an efficient binder to meet this demand. All kinds of material and all kinds of methods were put on the market and each and every one was promised by its enthusiastic discoverer or promotor, to be a complete panacea for all and every road trouble.

The fundamental principle governing the proposed change was the substitution of a bituminous bond for the old water bond. More or less success followed the application of the innovation, mostly less. Then nat-



This is a section of macadam road near Uniontown, Alabama.

urally was introduced the one overwhelming problem, namely the cost of producing such a road. Claims of small increases of cost of the new binder over the old were not always realized, and with this was a decided uncertainty of results, consequently the road builders at large, are, it may be said, awaiting results.

Another factor entered at the same time, and which has proved to be an overweening one, viz, the dust problem. Why communities having patiently suffered from this discomfort for years, in fact for all time should have suddenly aroused from the Atlantic to the Pacific and demanded relief from the dust nuisance is one of the psychological phenomena difficult to explain. Suffice it to say that the dust problem became paramount to road maintenance, and its suppression became the first duty.

Right in at this juncture stepped the bituminous promoter with the claim that his binder would suppress the dust. As a matter of fact it did not always do it. Occasionally successful results were obtained but not enough to ensure dust suppression from such binders.

Then came a further rush of dust suppression material; heavy oils, light oils and materials with no oil at all. Steady experiments have been made with these suppressors and results have been obtained for future guidance, and as a rule dust is being suppressed, but,

and here is the vital point, sometimes with disastrous results to the roads.

In this fairly uncrystallized condition of road practice it is pertinent to ask what is the wisest thing to do, giving, as is always desirable and always should be satisfactory, the best results for the least money?

The writer after many years of road construction on the old water bond method and a few years experimenting in other media, is somewhat of a standpatter, and still builds his roads on the water bond principle and they are being repaired in the same way, with a dust suppression material or medium used on the top. Until further satisfactory results are achieved in the other methods, the old system will be pursued except in specific cases.

Of course the application of this system pertains only to what is known as rural highways.

Taking a given system of city, suburban and rural highways, the practice on the two first are subject to individual preference and ability to pay, and need not be dilated upon in these remarks. It does not seem necessary here to go into a minute description of water bond macadam. Books and pamphlets galore are scattered over the country, and engineering practice is also extensive. Opinions differ as to methods and material, but careful comparison of these methods concedes that with care in construction and judgment in the use of materials uniform results can be obtained. The old controversy between Telford and Macadam is still active, but while good roads are built of macadam and also of Telford, there are also failures in both and it is not worth while to open any discussion on that line.

The selection of material nowadays with either binder or surface coating being used, is also not of such paramount importance as previously. The factor of

hauling here enters so intimately that a short allusion to this item may be of avail.

It may be stated that in the end it is cheaper to use the best material with a longer haul rather than a local inferior that lasts a shorter time. This point is not as prominent as heretofore for the fact is assumed that interjection of a binder as a surface coating eliminate the grinding tendency due to steel tires, and the rubber tire has a distinctly disturbing effect, rather than a grinding effect, so in this fact there is a distinct gain in the loss of wearing material in any kind of traffic.

This point can be further recognized in the selection of material for road construction where particular and specific material was specified as being more wearing and lasting. Good local material can now always be considered. Gravel, shale, chert, limestone, and granite can all be used with success if properly handled in construction and if the material is of sufficient consistency to resist crushing; provided further that suitable foundation is furnished and still further provided, and still more important that proper drainage is afforded.

Recognizing this fact in road construction a great change in practice may follow, with cheaper final results but with more onerous burden in the construction. This can be appreciated when one or two accepted standard materials are required with their known peculiarities. The selection is of course simple, the standard of construction is defined, and intelligence and care are all that is required for satisfactory results. With the use of the varied other material the responsibility of the road builder increases. Precedent is not at hand and he has to feel his way and by a process of elimination finally get the desired result.

As these remarks are supposed to include only the



A Beautiful Macadam Road Near Middleboro, Kentucky

subject of water bond roads, the writer wishes here to inject a salient principle. If water bond construction is not superceded surface protection should be considered as an integral part of the work, and all allusions are made with that end in view.

Of course there will be large extents of rural highwayways in the country where there will be little pre-disposition on the part of the different communities to use surface coatings, but as a matter of fact today a fairly large proportion of the good roads of the country are being protected by some coating or other, and it may be also fairly assumed that for a while at least a large proportion of the road construction now under way way or about to be pushed, will be of water bond type.

Given therefore drainage and foundation as accepted we have the diverse mineral aggregate with the varied coating materials superimposed.

The first point to be attended to is that the finished roadway should be smooth, and if possible, worn down before application of surface coating. This curiously enough is sometime hard to get. Take a finished surface of any material with fine aggregate on top, and no amount of rolling will give the smooth surface that iron or steel shod wheels furnish. Rubber tired autos alone do not give the desired results except very closely. The combination of the two, which is generally the actual condition will do the work, depending somewhat on the amount of clay or loam in the aggregate, and here comes up another question. Will, with clean stone delivered and rolled, the interjection of a binder of clay or sand act deleteriously to the application of the surface coating? The results of practice are eccentric. In the writer's experience a road coated with a trap surface of new stone, rolled and covered with a slight coating of loam, on top of which screenings are spread and rolled, then travel allowed to make the road smooth, after which a coating of oil is applied, made a good road, the oil lasting well. In another case the old surface was covered with loam, allowed to wear smooth, then the oil applied with good results. This coating, which was of heavy asphalt oil, was placed on the road in June and some of it was apparent the next spring. In cases where the surface was broken and the packing applied, and then the oil put on before consolidation, the remedy was worse than the disease, as the broken area enlarged instead of disappearing.

So far, average travel and a smooth surface is absolutely necessary for the application of any surface coating.

For automobile travel alone, the reverse seems to be applicable, for with a coating of screenings applied on the surface then a coating of oil, there is no consolidation or but little, no dust, no wear, but just the coating of screenings moved about by the auto wheels, with of course extra traction, which automobile drivers seem to ignore. All these remarks apply generally to all media with the surface application.

Other contingencies however arise in the selection and application of the surface coating, and the writer does not deem it appropriate to refer to any particular brand on the market but to allude generally to the difficulties arising from all.

Broadly speaking the surface coatings may be classified as those containing oil and those without it. The oils may be further divided into asphaltum and non-asphaltum. Oils as dust suppressors were first used in Algeria by the French Engineers, then the practice was initiated in California, and spread rapidly wherever the dust clamor arose.

The heavy asphaltum oils came into prominence and were extensively used for some years, but their application caused such deterioration of the surface by pitting and peeling that their use has been discouraged. Non asphaltum oils are now under advisement and a number of other materials much as glutrine, calcium chloride, etc., have been very extensively pushed and used.

The factors determining the use of those materials are probably more pertinent to the case than a dissertation on the merits of each individual medium, and they may be briefly stated as follows:

1st. Cost. The lowest first price material may not always be the most economical.

2nd. Efficiency in suppression of dust for the long-est period for one application.

3rd. The economy due to the fewer applications in the matter of maintenance.

4th. Comfort to the inhabitants in the way of odor and trackage of the media into houses by the feet.

5th. Damage to road surface by the application of the surfacing material.

6th. Damage to crops by the deposition of the material on fruit and vegetables.

7th. The result of the application of the particular coating to the particular aggregate.

All these factors are vital and should be considered in the selection of any given materials.

The writer has strayed away somewhat from his allotted subject but he felt that all his allusions were pertinent to the water bond questions. If however with progress and evolution of the road problems a better and cheaper primary bond can be found than water, he will as an engineer be ready to adopt it. However in all this road question, the financial end of it must be considered, as well as the ideal road and the problem of the future is to keep the ideal road with the least outlay. The question of maintenance of the roads of this country is really today in some sections of more moment than the construction. When the state engineer of New York stated that it cost 10 per cent of the original cost of the road annually to properly maintain our highways the conception of this fact must be to maintain the standard of excellence that is desirable. This estimate is fully born out by the writer's experience on the present practice of water bond construction and maintenance.

The efforts made by the past few years in the penetration and mixing line have not resulted in uniform success in construction or cheapness in maintenance, and furthermore the results have been that in efforts to reconstruct one mile of ideal road, from five to ten miles have been neglected on account of lack of money. This should act as a restraining influence on undue expenditure for uncertain methods which has been the late experience with a consequent dissatisfaction on the part of the travelling community, the tax payers.

Arthur H. Blanchard, M. Am. Soc. C. E., Professor of Highway Engineering, Columbia University, has been appointed by Governor Sulzer a member of the Advisory Commission on Highways for the State of New York.

Engineer G. R. Dabney has completed the preliminary surveys for a road system in Smithville precinct, Bastrop county, Texas, covering 50 miles. Contracts will be let at an early date for the entire mileage.

Government engineers are supervising the building of a model road from Belton to Temple, Texas.

Relation of the Contractor to the Public Official

By C. A. CRANE

Secretary of the General Contractors' Association

A DISCUSSION of the relation between contractors and public officials might be divided under three heads—what they are thought to be, what they are and what they ought to be.

What they are thought to be finds its only parallel in the nursery belief in Santa Claus, which is no more hallowed than the time-honored tradition in every newspaper office in the country concerning the financial status of contractors. There is never an event chronicled in the press in which a contractor figures, that he is not mentioned as “so and so, the wealthy contractor.” All of which prompts the unnecessary question, “Where did he get it?”—unnecessary because the general public harbors the delusion that the wealth was attained in public contracts in collusion with public officials.

There is perhaps no industry which is so intimately connected with the progress and welfare of a country as that of the contractor. His task is the physical development of the locality. The work is in the open and its progress is carefully watched by the community. Every passer-by is a self-appointed inspector; his criticisms are governed more by personal inconvenience than by any real knowledge of how or why the work is being conducted, and proportionate with the inconvenience, is the firmness of his conviction that the contractor and the public officials are leagued together in a “public be damned” policy. In any event it is the popular belief that the contractor is amassing a fortune and only gets his contract through “pull.”

In all candor we are bound to admit that there has been great justification for this belief. Doubtless we are all familiar with the practice, sometimes observed in the smaller towns, of receiving the bids in public, but opening them in executive session. To insinuate on the reasons for such a custom is inadequate—experienced contractors know. These irregularities are deplored by honest contractors—if you will admit there be any—in fact they are deplored by every contractor except that particular one who gets the contract—and the very first time he finds the trick has worked in favor of another, he shouts the loudest of all.

Just as dishonest officials are in the minority so are honest contractors in the majority, and they are equally anxious with honest officials and the public generally that the contracting business shall be put on legitimate basis, which will afford every opportunity for honest competition and minimize favoritism and graft.

A recent editorial in one of our large dailies, commenting on the expenditure of public funds for a large improvement contained this sentence: “In dealing with contractors eternal vigilance is essential.” The implication there is that the contractor is the culprit—but dishonesty can't thrive single-handed.

You must correct contract abuses and establish legitimate practice before you can succeed in building good roads or anything else, no matter how theoretically perfect a set of specifications you may devise. Since we must all confess that the relations between contractors and officials are not always above suspicion, the problem is to remove the opportunity for sus-

picion. Why not adopt the policy of the hotel keeper who announced on his bill-of-fare that “to prevent fruit being taken from the table, there will be no fruit.” Cut out all personal relation between contractors and political officials and let these relations be through the proxy of the engineering official. Choose a big man in his profession and pay him a big salary—put him under a heavy bond to guarantee the accuracy of his work and the validity of his certificates of payment. Why should a disbursing officer be held responsible for an engineer's voucher, unless he has equal facilities for checking the work that the engineer had in computing the amount? Centralize the power and the responsibility.

Contractors prefer contracts with railroads and private corporations to public work, because their dealing are almost entirely confined to the engineer or the



This is a piece of state highway in the only southern state that is properly organized, equipped and financed for state road building. This road is near Washington Grove, Maryland

architect, and they are not encumbered with the delays and red tape that characterize our contracts for public work. To one lawsuit over a railroad contract, there are a hundred over public contracts—and is this not because the railroads employ a higher grade of men to superintend their construction? They are men who are competent to and do settle disputes fairly, unhampered by the statutes and ordinances under which public work is conducted. It is true there are many of our large public improvements to-day going forward under the guidance of the best engineering talent in the country. To these few exceptions our criticism does not apply—but to the general custom which places inefficient men in charge of engineering construction on public work.

A serious mistake made by public officials is to underestimate the necessity for paying high salaries to engineers. Well paid positions will attract a higher grade of men and remove temptations which beset the path of the under-paid engineer in the field. The men in the field are relied upon by both the chief engineer and the contractor, and the greatest risk the contractor assumes lies in the ability of this sub-engineer to

whom is delegates the power of interpreting the contract.

The success of a contract lies in its execution—not in its wealth of legal protection for the contracts. Take any contract issued today for public work to a lawyer and ask his opinion of it. He will tell you a man is a fool to sign such a document. It is so drawn as to provide every safe-guard for the contracts, and to place entire responsibility for everything that may happen, including the acts of Providence, up to the contractor. He literally signs away all his rights in the present and hopes for the future. This is not the work of the engineer, but of the legal officials.

But the contractor wants the work, and in the contracting business three qualities are essential—faith, hope and nerve, and the greatest of these is nerve. Nerve to disregard counsel's warning, faith in his own ability to do the work, and hope that the engineer in direct charge of his work will give him a square deal.

It is impossible to over-emphasize the importance of the relation of this engineer who is in direct charge. He is called upon to give immediate decisions on important questions, in the absence of his superior. He is clothed with all the powers conferred in the contract and these are liable to be over rather than under-exercised by the too zealous and inexperienced engineer. Care in the selection of his deputies, and personal attention to their training by a chief engineer are tremendous factors in securing harmonious relations with the contractors. Constant bickering prevents good work, and the chief engineers who have

been most successful are those who have infused in their subordinates the realization that tact and diplomacy win more battles than obstinacy.

Most contracts designate the chief engineer as the arbiter of all disputes over the amount and fitness of the work, his decision to be final and binding on the contractor, but this power is usually qualified elsewhere in the contract by providing that the engineer's decision shall be subject to the final determination of the commissioner or the board, as the case may be.

This qualifying clause might easily become a mischief breeder. Any loopholes which permit the slightest chance for questionable dealings between contractors and officials should be guarded against. The days of the contractor with a "pull" are passing. Even the simplest class of public improvements is now supervised by an engineer. The less that contractors and commissioners come in contact the better. The commissioners' attention should be devoted to the administrative details, with matter pertaining to construction left to the engineers. The engineering profession fortunately ranks high in integrity, and the unfortunate cases in which scandal has entered into the contracts are but rarely charged to any dishonest acts by or collusion with, the engineer. The objection raised to allowing the engineer to be the final judge as to the quantity and fitness of the work, is that since he is paid by one of the parties to the contract he is naturally biased toward his employer, but it is generally conceded that in the majority of cases the engineer who has designed and supervised the work is best fit-



A Fine Stretch of Macadam Road Running Three Miles From the City Limits of Huntsville, Alabama

ted to make the decisions. There are many questions, however, which arise that are not concerned solely with quantity or quality, questions of judgment or questions of proper interpretation, and we believe disputes of such nature should be submitted to arbitration. No honest and capable engineer fears or can object to any scrutiny of his work by an equally competent fellow engineer, and, therefore, an appeal from his decision should be allowed before a referee competent to pass upon the technical matters involved. This is the only form of appeal which should be permitted in the contract. An appeal to the board or to a commissioner can be made only for the purpose of securing through friendship or worse what the engineer will not allow, and if the board of commissioners is honest and has confidence in its engineer, it naturally will deny the request. The position of the engineer who would be asked by his board to alter his determination would be exceedingly unpleasant. He would be in the dilemma of refusing to obey orders or of certifying to something against his judgment. Engineers are human and jobs are not always plenty, and we realize that engineers have their troubles as well as contractors. To avoid much dilemmas, the engineering profession should demand a form of contract providing that their rulings could only be reversed by arbitration before a member or board of their profession.

We realize that there are many questions of law involved in contracts that are often the subject of division by members of the bench, but we submit that if the preparation of the entire contract, as well as the specifications were left to the engineer, he would at least be able to prepare as comprehensive a document as the lawyers, and there could hardly be any question involved which another engineer could not understand for the purpose of making a fair decision. A suit at law is not the most satisfactory way to settle a dispute which really hinges on the question—was the work done as it was intended and represented in the contract? Lawyers naturally look for legal points of attack and defense, and many a case has been decided on a pure technicality far beside the equity of the suit.

This arbitration question has been tried out in many forms and unfortunately no method has yet been adopted that seems satisfactory. The Rapid Transit Commission in New York City some years ago provided that an appeal from the chief engineer's decision should be submitted to a board consisting of one arbitrator chosen by the commission and one by the contractor, and on the failure of these two to agree, a third was to be appointed. It is obvious that the decision thus really lay with the third man, and it would seem a short-cut to name the third man first. Mr. Onward Bates in a very able manner before the American Road Congress at Richmond in 1911 pointed out this very difficulty, and after several years trial by the old Rapid Transit Commission and the present Public Service Commission, the scheme of arbitration has been dropped since it proved quite as costly and consumed as much time, if not more, than the regular court procedure. It would seem that the single arbitration is the solution of the difficulty, and this scheme is concurred in by the National Federation of Building Trades Employers of Great Britain which recently prevailed upon the council of the institution of municipal and county engineers to adopt a modification of the cause regarding the engineer as the sole arbiter of disputes. The council recommended the adoption of a clause submitting the dispute to a single arbitra-

tor to be appointed by the President of the Institution, the award of such arbitrator to be final and binding upon the parties. The nature of the questions to be submitted for arbitration is to be confined to the interpretation of the contract or any matter arising thereunder, but not on decisions as to the quantity and fitness of the work and also as to the withholding by the engineer of any certificates to which the contractor might claim to be entitled. The arbitration is not to apply to any contract amounting to less than \$5,000 and no question involving a sum of less than \$250 should be considered. We believe that some such measure might well be considered by our public officials. It would minimize litigation and thus remove one of the greatest sources of friction between contractors and public officials.

The attempt to regulate these relations and to prescribe by statute for nearly every contingency that may arise in a contract is in our judgment a mistake.



This is one of the roads that a rural carrier from Fort Smith, Arkansas, travels every day. Note the depth of the ruts as shown by the handkerchiefs

Laws are no stronger than the men who enforce them, and if it be the fact that laws are necessary to curb our public officials, something is radically wrong with our system of government. You can't legislate honesty into a man. You may render him more cautious, but if he be dishonest he will circumvent any law made. What we need is better men, not more laws, and public office must offer the best men suitable compensation for their services to the public.

This subject is one that cannot adequately be discussed in a limited space such as I have here. So much depends on the relation of the contractor and the public official—the success of the smallest undertaking. Reduce them to a minimum—cut out all relations with the political officials—divorce contracts from politics, and the millennium will be at hand.

On August 12th, Wake county, North Carolina, will vote on a bond issue of \$1,000,000 for building a fine system of highways throughout the county.

Iberia parish police jury is contemplating the issuance of bonds to the amount of \$120,000 for building roads.

Cass county, Texas, will issue bonds for \$35,000 for road improvement.



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THE SOUTHERN NATIONAL HIGHWAY.

Of all the projected national highways none possesses more merit than the Southern National, which is to run from Morehead City, on the Atlantic coast, to San Diego, California, on the Pacific. Following the line of the Central Highway in North Carolina, which is now practically completed, the highway passes through Tennessee along the Memphis-Bristol highway from Knoxville. Crossing the Mississippi on the great new public bridge at Memphis, it will go to Little Rock over a fine macadam road for which provision was made by the legislature of Arkansas, on to Fort Worth, Texas, to El Paso and thence to San Diego, California.

The highway will be one of singular charm to the motorist. It drives straight through the most wonderful mountain scenery of the Appalachian range and affords a wide range of conditions, climate and scenery. It is located far enough south to be open for travel the year round and that adds wonderfully to its importance.

It would cost Uncle Sam something like \$20,000,000 to build the road and it would be money well spent. It would serve as a mighty stimulus to the good roads movement in every southern state that it touches and would result in the construction of hundreds of lateral lines, connecting every part of the south with it.

Twenty millions of dollars is a "hefty" sum of ready

cash but your Uncle Sam thinks in terms of millions and that is just about what one of the latest dreadnought battleships costs complete. These mighty fighting machines which cost so many millions, last but a few years and must be replaced with newer, more deadly and more costly weapons of warfare and their value to us is problematical. Leading statesmen are beginning to question the wisdom of spending the nation's money in preparations for wars that will never come. There is but little prospect of war between any of the great nations of the earth and it looks foolish to keep on building battleships and forts and submarine boats and all that sort of thing when the money might be spent in bringing happiness to millions, and wealth and prosperity to countless thousands.

Those who oppose federal aid for road-building are not as numerous as the clan that once opposed it. We believe that a majority of our national lawmakers are for federal aid and that as soon as the tariff question and nation's banking troubles are settled, there will be passed a federal aid bill that will revolutionize roadbuilding in the nation. The old-time howler against federal aid in road-building has had all the props knocked from under him.

We have called attention to these facts several times but it is just as well to keep them in mind: Congress has appropriated to railroads (in public land subsidies) \$1,000,000,000; to rivers and harbors, unimportant creeks and branches, more than \$600,000,000; to public buildings for towns big and small, \$213,376,000; to the Panama canal, \$400,000,000; to road-building in Alaska, Porto Rico, the Phillippine Islands and other possessions, many millions of dollars. It is about time Uncle Sam was doing something for the highways of this country and we believe that great things are in store for us.

If you will take the trouble to investigate you will find that with all of this tremendous expenditure of money, the south has "come out at the little end of the horn" every time. Our rivers have received but little attention, comparatively, and only recently has any attention been paid to our sea-ports. It would be the right thing for the national government to do to start building its system of national roads in the south and the Southern National is the very first road that should be built.

A GOOD ROADS GOVERNOR.

When Hon. Locke Craig was nominated for governor of North Carolina the news went out that he would be North Carolina's "Good Roads Governor." Nobody knows just how the story got started but it did get out and when he went into office and sent his first message to the legislature, nobody was surprised that it strongly endorsed the good roads movement and called for progressive road legislation.

As a good roads governor, he is making good. He is more than living up to the expectations of his friends and admirers. He does not feel that it is beneath his

dignity as governor of a great state to get down among the folks at Smith's Cross Roads, Jones Corner and Licksillet and rub elbows with them and he preaches the gospel of good roads to the shirt-sleeved son of toil in the obscure country districts with as much grace, fervor and effectiveness as if he stood among the nation's leaders in the nation's capital.

Locke Craig is all right. He is the right sort of stuff. North Carolina has had great governors but she has never had a governor with more manhood, more patriotism, more love for humanity, or more innate, in-born goodness than Locke Craig has.

We wish that every state in the union, and particularly every southern state, had a governor like Locke Craig and we could wish them nothing better.

The Second Federal Aid Convention.

That National Government participation in the highways progress of the country should first concentrate itself upon main roads was the predominant current of opinion in the Second Federal Aid Good Roads Convention held in Washington, D. C., during inauguration week. Called by the American Automobile Association, motorist delegates, nevertheless, were in the minority, as general roads bodies and chambers of commerce supplied the greater part of the several hundred representatives from the 46 states which in one form or another were embraced in the nation-wide gathering. Members of congress in many instances spoke for their home organizations and their utterances indicated growing knowledge of the bigness of the subject.

One of the features of the convention was the call at the White House, President Wilson receiving the delegates in the East Room and expressing to them his great interest in highways improvement. John A. Wilson, first vice-president of the A. A. A., introduced good roads advocates to the nation's chief executive, who paid a special compliment to Chairman George C. Diehl in reference to his extensive knowledge of the roads question.

The speakers of the convention were of national repute and the subject was considered principally from a federal standpoint, though reference was repeatedly made to the fact that state systems of roads with county and township tributaries were of prime importance and required thorough consideration in the rounding out of the country's roads transportation problem.

No more concrete summing up of the situation was expressed than that employed by Chas. B. Stetson, chairman of the executive committee of the National Grange, who in concluding his address said: "We do not believe that federal aid means the appropriating of National funds for local improvement of roads. It is certainly wrong to ask national aid to do what properly belongs to the local community to perform, and in any good roads movement the state is the unit to which the municipality should look for aid, and the state in turn to co-operate with the national government for interstate roads and other roads that are of sufficient importance to warrant the employment of national aid in building. Any other course is untenable, unconstitutional, and basically wrong. But we do ask of the men who are trying, and conscientiously trying, to build interstate and transcontinental high-

ways to remember the necessity of improving the road from the home to the city of the man who is promoting the great basic industry of our country to the end that all the people in this great country may ultimately be benefitted."

The committee on resolutions comprised a member from every one of the 46 states which sent delegates and before Chairman L. R. Speare and his associates concluded their labors several sessions were required. In the adoption of the committee's report the convention unequivocally placed itself on record as favoring a plan of interstate roads, the preamble and resolution reading as follows:

Whereas, In the development of our country's transporting appliances for man and goods from place to place, it has become almost the universal will of the people of the United States for better roads; therefore, be it,

Resolved, That we recommend our federal government to build and maintain an inter-state system of highways connecting the capitals of the various states, and with the national capital.

In the following resolution all states were urged to establish highways departments:

Resolved, That we advocate the creation, wherever they do not now exist, of effective State Departments of Highways, in the various states, and that copy of this resolution be sent to the governor of each state.

Congress was thus asked to create a standing roads committee:

Whereas, federal aid for good roads has become of such national interest and importance, and

Whereas, The Second Federal Aid Good Roads Convention feel that this subject should be considered by congress with the greatest care, therefore, be it

Resolved, That congress be respectfully required to create a standing committee on national roads.

After the speech of the Hon. Stanton Warburton of Washington, in which he advocated a system of national military roads, and put forward the proposition of paying for them by a restoration of the tobacco tax of 1879, a resolution was passed calling for a renewal of the former tax rate and the use of the excess in building a national or interstate system of highways.

An amendment offered by Representative Dorsey W. Shackleford of Missouri, providing "that the money raised by this taxation be set apart as a fund to be applied to the construction or maintenance, or both, of such roads as congress shall give aid to by legislation," received only two votes. Mr. Shackleford is the author of the proposition for the payments of roads rental by the national government for roads used in rural free delivery.

The convention committee on resolutions was authorized to appear before the joint committee of congress on federal aid.

The board of public improvements, it is announced will proceed to remove the present bridge on 12th Street, St. Louis, Missouri, and replace it with a reinforced structure to cost \$350,000.

Sumter county, Georgia, decided in favor of present unstable bridges and culverts and voted down a bond issue of \$90,000 for constructing modern concrete culverts and steel bridges throughout the county.

Jackson, Mississippi, will replace all wooden bridges in the city with steel and concrete structures.

Road-Building, Road-Boosting and Road-Boosters Throughout the Nation

All hope of getting road-building out of politics in New York state was scattered to the winds when Governor Sulzer's Advisory Highway Board selected as its chairman James E. Gaffney, the well-known partner in the contracting business with Charles F. Murphy, chief of Tammany Hall. At least, that is the view a host of good roads advocates in New York take of it.

This Board is going to advise the new Highway Commissioner, whoever he may be, how to conduct the department, and incidentally to assist the governor in the selection of a new commissioner.

The Tammany men were a good deal elated when they heard of the selection of Mr. Gaffney. For a time he represented Mr. Murphy's district in the Board of Aldermen, and has been long a favorite as well as a business associate of the Tammany leader and one of the largest contractors in New York, Mr. Gaffney, so the smaller contractors believe, will not do anything to hurt that line of business, and there has been dispelled the fear that the Highway Department will be taken out of politics.

Mr. Gaffney was elected chairman of the Board after Charles E. Treman, one time Commissioner of Public Works declined the place. The board went on record against supplemental contracts which involved additional expenditures without re-advertising. Governor Sulzer announced the following additional members of the board:

Henry J. McCard, of Merrick, L. I.; General Amos A. J. Parker, of Albany; John J. Hooper and Augustus Thomas, of New York.

* * *

Rev. Billy Sunday, the famous evangelist, engaged recently in holding one of his revivals at Columbus, O., commenting on the Rural Life and Good Roads Congress held in that city March 12 and 13, said:

"You cannot make it too strong. I am heartily in favor of good roads for Ohio and everywhere else. There is no way in which the money of the people could be better expended. It is among the big, living questions of the day. Better roads means increased attendance at churches and schools and will help both the cause of Christianity and education. In my travels about the country I have seen what a great good comes wherever the highways are improved. They add a civilization and make for better conditions. I hope to see favorable action on the proposition taken in Ohio and it has my earnest endorsement."

Sunday has been denounced as a notoriety-seeking individual, possessed of barely a smattering of religion, but this statement marks him a man of considerable discernment. If he has his religion on as straight as he has the good roads gospel, he is not a bad sort after all.

* * *

Governor Locke Craig, of North Carolina, is one of the liveliest good roads boosters in the United States. For many years he has taken a great deal of interest in every movement for road improvement in the state and he never failed to put the weight of his influence behind it. Now that his people have honored him with the highest office in their power to bestow, he still sticks to the role of good roads booster. He took part in the good roads campaign in Davidson county April 1, de-

livering fine addresses at Lexington and Thomasville in advocacy of the \$300,000 bond issue for good roads. His visit greatly encouraged the road workers and set them about their fight with renewed zeal.

* * *

No manufacturers of road-building equipment ever issued a handsomer catalogue than that of the Russel Grader Manufacturing Company, of Minneapolis, Minnesota. Every machine is shown in colors and smaller cuts accompany the pictures of the complete machines, showing every detail of construction. The text is admirably arranged and is so simply worded that every feature of the machines is made plain. Road-builders everywhere should have a copy of this catalogue.

* * *

The Chicago Association of Commerce promoted a big good roads dinner Saturday night, March 22 at Hotel Sherman. Governor Dunne was there and with him the members of the legislature. Representatives of every organization in Cook county that is in anyway interested in road building and maintenance, attended the dinner.

* * *

The members of the Ohio Roads Federation believe that they have a live wire in Mr. Z. D. Dunlap, recently appointed field organizer for that organization. He starts his campaign in Columbus and will spend three weeks in that city. It is his aim to strengthen the organization throughout the state by securing new members and every part of the state will be visited.

* * *

The Bristol, Virginia, Board of Trade pulled off an interesting good roads meeting on March 27th. The purpose of the gathering was to consider the organization of an association to build a pike road from Bristol to the Kentucky border in Wise county, running through Washington, Russell and Wise counties.

* * *

The Good Roads Machinery Company, of Kennett Square, Pennsylvania, have issued a special catalogue showing their complete and up-to-date line of road oiling machinery. The catalogue is well gotten up, printed on excellent paper and the press work is very fine. It contains a number of excellent cuts showing oiled roads in all parts of the country and a very valuable treatise on "Dust Laying Preparations and Bituminous Binders."

* * *

Seeking to arouse his people on the question of raising funds to complete the Memphis-Bristol Highway, Mr. W. A. Johnson, of Memphis, writes a strong letter urging the voting of a bond issue of \$100,000 for the purpose. He calls attention to the fact that the Southern National Highway is to run through Shelby county and Memphis and that many other advantages would come from the building of the road. He says:

"Now that we are to have a new bridge across the Mississippi River at Memphis, providing free driveways for vehicles, I hope the people of the entire state, and especially the people of Memphis and Shelby county, will realize what it means for Memphis to secure,

or lose, the opportunities they have, while the legislature, is in session, to create ways and means for the building and maintaining this highway, that will make for the state and the counties through which it runs millions of dollars by increased valuation, aside from the greater feature of making rural and city life more worth while.

"The Federal Bureau of Roads furnished an able engineer, R. E. Toms, who has completed the survey of this road in a satisfactory manner, and an expert in this department has been asked for by the writer to meet with us this week, to discuss this subject. So far the money to defray the expenses has been raised from the sale of buttons, but at present there are no funds available for this work.

"Work already done on the Memphis-to-Bristol highway, and the nearness of its completion, are not realized, and especially by our people in Memphis and Shelby county, on account of 26 miles in Shelby, six miles in Fayette, part of the mileage in Haywood, and a few miles in Madison being unfinished.

"Between Nashville and Bristol 181 miles of the proposed Memphis-to-Bristol highway have already been built and graveled. Contracts have been let for 765 miles additional. Cannon county has appropriated for this work \$5,000; Warren, \$11,800; Sullivan county has a bond issue of \$450,000, White county \$90,000, Cumberland 540,000, Roane \$20,000, Loudon \$40,000 Washington \$66,000, Carter \$60,000."

It is to be hoped that Shelby county, the richest county along the line of the Memphis-Bristol Highway and one of the wealthiest on the Southern National Highway, will not be the first to fall down on the job.

* * *

The Whitman Co., advertising experts of New York, are sending out a series of pamphlets for the Wood Drill Works, of Patterson, New Jersey. The pamphlets are in the form of personal "Talks by the Drill-master" and the first of the series, which has just reached this office, is distinctly worth while. It is illustrated with handsome half-tones, showing the Wood Rock Drill at work in Culebra Cut, Panama, and at other places.

* * *

Davidson county, North Carolina, is in the midst of a hard fight for a bond issue of \$300,000 for good roads. With the exception of two obscure members of the profession, every physician in the county is behind the bond issue and fighting hard for it. At the last meeting of the Davidson County Medical Association, a resolution was adopted that Southern Good Roads desires to pass on to other counties, hoping that their example will encourage others.

Whereas, There has been a bill introduced to the legislature and passed providing for the calling of an election on the 22nd day of April, 1913, to vote on a bond issue of \$300,000 for the building of good roads in Davidson county,

Be it Resolved, by the Davidson County Medical Society in regular meeting assembled at Lexington Monday, March 3, That this society heartily endorses and approves the movement for the county bond issue and pledges the support and co-operation of every member of the society to the movement for better roads; Second, That every member of this society hereby promises and agrees to make it a part of his business to talk and work for good roads in Davidson county from now until after the election, or until after good roads bonds are voted at some subsequent election.

Signed: D. J. Hill, President; J. R. Terry, Secretary; E. F. Long, M. A. Bowers, E. J. Buchanan, W. J. Ves-

tal, R. V. Yokley, Chas. M. Clodfelter, A. Anderson, J. H. Mock, J. E. Hobgood, J. W. Peacock, C. A. Julian, F. L. Mock.

* * *

A good roads meeting was held at Lewisburg, Tenn., March 15. It was largely attended. W. T. Hurt was elected chairman and J. J. Murray secretary. The meeting was attended by Representative Miller and Senator Fulton, who desired to get the sentiment of the people in regard to a road law for Marshall county. Every phase of the road question was discussed and a committee was named to draft a bill and report back to another mass-meeting which was scheduled for March 29th.

* * *

At Hamilton, Texas, on March 14th, was held a good roads meeting that for attendance and interest eclipsed everything in the way of a good roads meet that has ever been pulled off in that section. The San Antonio Express goes far enough to say that it was the biggest gathering in the history of road movement in Texas.

According to reports, the speech of Mr. George D. Marshall, an engineer of the U. S. Office of Public Roads, on "Good Roads Yesterday, To-day and Forever," was the feature of the session. He is not only a good engineer but he is a very fine speaker.

There was a big wrangle over the location of a highway in which the people of that section are interested and the debating lasted all the afternoon. It was finally decided that the highway shall run from Lampassas north through Hamilton, Hico, Duffau to Glenrose. A substitute providing for the running of the highway from Hamilton to Granfils Gap, Clifton, Meridian, Cleburne and on to Glenrose, was voted down. It is related that the towns of Hico and Hamilton were represented by 300 citizens. The good ladies of Hamilton served dinner to 400 visitors.

* * *

At Midland, Texas, last month the Commercial Club had a good roads meeting that stirred up no little interest. Before the meeting ended a campaign for a bond issue for building roads in Midland county was formally launched and petitions were prepared for circulation, asking the county commissioners to call the election. Judge S. A. Penix, of Howard county, was the principal speaker and he delivered a fine address.

* * *

Altona is a little village down in central Illinois. It is a station on the proposed "Cannon Ball Route" between Quincy and Chicago through Aurora for a great automobile highway.

The Altona Good Roads Association members had a meeting the other day. They were informed that their assessment for putting up guideposts and signs was \$25. In fifteen minutes they had raised \$37.50 and now they promise a hundred dollars before they finish.

That is the proper spirit. Good roads in Illinois would be only a question of time if all the men of the state were like them.

* * *

Hon. Logan Waller Page, director of the U. S. Office of Public Roads, believes that there is nothing more important than maintaining roads after they are built. Commenting on this phase of road work he said recently:

"Too much stress can not be laid upon the importance of maintenance in connection with the work of improving the roads. The people in nearly all the states are filled with enthusiasm for road improvement and are spending enormous sums of money in

the construction of superb roads, and yet almost without exception they are making little provision to care for the roads after they are built. This is true not only in the various counties, but under many of our state highway departments.

"To maintain the roads in good condition year after year requires a considerable annual outlay, but this outlay is infinitely less than the loss which must fall upon the people eventually if they allow their roads to go to utter ruin. The thing for all advocates of good roads to do is to urge continuous, systematic maintenance and the setting aside every year of an amount per mile estimated by the engineer in charge to be sufficient for the proper maintenance of the road—a course which must make for economy and efficiency."

* * *

There was a mass-meeting of citizens at Thornton, Texas last month which resulted in the formation of a good roads association. Mr. O. R. Roscoe was elected president and Mr. W. A. Terry, secretary. Committees were appointed to prepare for the calling of an election to vote on a good roads bond issue.

* * *

President W. W. Finley, of the Southern Railway Company, puts in a good word for the good roads cause wherever he goes. At New Haven Conn., he addressed the New Haven Chamber of Commerce and this is a part of what he said about roads:

"The county highway, as the road over which farm products move in the first stage of their movement to the consumer and over which merchandise is distributed in rural communities, is an important factor in our national life in which residents of cities and towns as well as farmers are interested. Heretofore, in many parts of the United States, these roads have been poorly built and inadequately maintained. In later years there has been an awakening to the great economic importance of good roads which has given effective vitality to a nation-wide movement for the improvement of the country highway."

* * *

They are just beginning to get on to the split-log drag in Harrison county, Mississippi, as the following clipping from the Biloxi Herald will show:

"James Brodie, a well known planter whose farm is situated across Back Bay, will make an experiment on the half mile of road in front of his farm, using the King split-log dragging outfit. The small cost will be defrayed by the Biloxi Commercial Club. This device, it is said, makes a splendid crown on a road and keeps it in first class shape, it is said. F. W. Elmer, supervisor from this beat, who is greatly interested in good country roads, has given his consent to the experiment and is watching its outcome with great interest."

The split-log drag will make good at Biloxi, even as it has made good in all parts of the United States.

* * *

Speaking of the Kentucky system of toll pikes, Mr. L. H. Ramsey, a good roads booster of Kentucky, secretary of the Louisville Auto Club, said recently:

"When Kentucky was settled there was a demand for consecutive good roads from one extreme of the state to the other, and this demand resulted in the building of some magnificent highways by the state. The principal money used in their construction was from the school fund. This was invested in the toll pikes with the view to a permanent income which should go back to the school system. The state paid

nearly \$1,000,000 of the cost of the construction of the two Louisville and Nashville pikes. When railroads were completed to all parts of the state these roads were not maintained properly and were finally made public roads, and for fifty years have been neglected. Within the last decade there has come from all the people a desire for the rebuilding of these roads.

"With this demand for roads the question at once arises of securing the necessary money. This has been done in some few instances by the issuance of county bonds, but for any county in Kentucky to issue bonds requires a two-thirds vote. This has defeated most attempts of this kind. A plan of state aid to the counties has been proposed, but has not been approved by the legislature."

* * *

The first definite steps toward pitching the campaign for better roads in DeWitt county, Texas, were taken when an organization, to be known as the De Witt County Highway Association, was perfected recently with Alex Hamilton of Cheapside president, D. B. McManus, of Thomaston, vice president and G. H. Harris, of Cuero, secretary. The new organization will work under the direction of the Cuero Commercial Club.

The meeting was called to order by President Lee Joseph, of the Commercial Club, who presided until the regular officers had been elected.

A committee was appointed to look over the situation and report whether it would be better to petition for an election for the county, the Cuero precinct, or a road district, for which the boundary lines should be named in the petition. This committee is composed of F. P. Sames, Chas. Schlinke, T. A. Graves, D. B. McManus, Frank Kunetka, with President Hamilton and Secretary Harris added.

A membership committee was appointed as follows: Adam Kahutec, Fletcher Elder, L. A. Carter, A. F. Dietze and S. C. Smith.

S. C. Smith of the Texas Motor Car and Supply Company addressed the meeting and placed at the service of the new organization as many cars as necessary up to seventy-five, free of cost, to carry the voters of De Witt county down near Port Lavaca, to let them see the good roads that have been constructed there. He also tendered the use of his launch for such an occasion and promised a clam bake at any time the voters of the county feel disposed to take up his offer. His speech lent much enthusiasm to the meeting.

* * *

That the rapid progress in the development of Victoria County, Texas, so noticeable during the last two years, is due in a large extent to the good roads that are being made a feature in that county, is the opinion of Richard Jones, superintendent of the Victoria division of the Sunset Central Lines.

"It is remarkable the way our county is setting up," said Mr. Jones. "The part of the county which was nothing but big pastures a few years ago is now being put into farms and is showing the progressiveness that belong to a country like that. We have the soil, and the seasons, as well as the climate, to make it a great agricultural and truck growing district, and now that the big ranches have been thrown open to farmers and with the good roads building, the county is rapidly coming into its own."

The city of Fort Worth, Texas, has under construction the longest pave driveway in Texas, the distance being approximately four miles. When completed, it will cost about \$1,250,000.

GOOD ROADS NOTES

GATHERED HERE *and* THERE

Alabama.

The people of Birmingham, Ala., are looking forward to the approaching meeting of the National Good Roads Federation in that city. The Ledger says that the executive officers are busy making preparation for it and every mail brings acceptance of invitations and assurances from delegates that they will be in attendance from various states in the union. The program of the convention will contain some of the most distinguished speakers and active good roads workers in the United States. The latest acceptance is that of T. T. Fauntleroy, a noted orator of Missouri, who will address the convention on the subject of "National Government's relations to Good Roads." It will be a treat to hear this distinguished orator.

Joe L. Long, of Des Moines, Iowa, will address the convention on "Partnership Principle—How Best to Bring About Co-operation Between the Nation, State and County in Road Building."

Thomas L. Cannon, an eloquent speaker and one of St. Louis' most enterprising and public spirited citizens, will address the convention on "Big Paths For Uncle Sam." Mr. Cannon is a member of the executive committee of the National Good Roads Federation.

Senator John H. Bankhead, who suggested the idea of consolidating all of the national good roads organizations in one great body in Birmingham two years ago and who is actively interested in the good roads movement, is expected to preside over the meeting if his duties in the senate will permit him to be present.

C. C. Gilbert, member of the state legislature of Tennessee and one of the leading good roads advocates, writes Secretary J. A. Rountree that there will be a large attendance of good roads advocates from his state.

Saturday Secretary J. A. Rountree in the name of the National Good Roads Federation, joined by the Alabama and Jefferson County Good Roads Associations, Chamber of Commerce and Business Men's League, wired an invitation to the Tennessee legislature which is now in session, inviting them as a body to attend the meeting of the federation on April 24-25.

* * *

Florida.

Governor Park Trammel, Florida's new chief executive, announces that he will call on the legislature which meets this month, for a great deal of progressive legislation. In a statement given out recently he had the following to say about road laws:

"Within the past decade the public has become more or less alive to the necessity of and the advantages derived from good roads. This good roads sentiment has become quite general in Florida. A large number of the counties of the state are now either by direct taxation or by funds raised from bonds engaged extensively in good roads construction and improvement. With the expenditure of the large sums of money which is now being applied and will in the future be used in even larger amounts for road building, it will be both wise and economical to have the roads of the counties laid out with system; to have them made of proper materials and scientifically constructed. There is no

avenue for greater waste of public funds than in road building, when the work is carried on in a slipshod fashion, without proper skill, a comprehensive system and suitable material.

"I believe that the county should be the unit for road building; but while the first object should be to serve the people of the county which defrays the expense, each county should be neighborly and co-operate with the adjoining counties in making proper and suitable connections for highways.

"To advance the good roads movement, to bring about greater efficiency in road construction in the various counties of the state, to ascertain the most advisable methods, the best materials to be used, and in a general way to have the road building of the counties placed upon the most economical and business-like basis, I believe it advisable to have created a State Road Commission, to be composed of three members, who shall be allowed their expenses when engaged in the public business, but who shall serve without salary.

"The said commission should be granted ample authority to conduct all inquiries, to make all necessary investigations, and take all necessary action for the advancement of public road improvements in the state. The commission should be authorized to employ a highway engineer, at a salary of not exceeding twenty-five hundred dollars per annum, who should be required to investigate and report on the methods of road construction best adapted to the various sections of the state and define standards for the construction and maintenance of highway in the various counties of the state suggest routes for state highways, and perform such other duties incident to and properly connected with such position. He should also co-operate and advise with the boards of county commissioners and county engineers with reference to county roads.

"To defray the expenses of such commission an annual appropriation of not exceeding six thousand dollars should be made."

* * *

Kentucky.

The meeting of the county road engineers in Louisville April 7-9, inclusive, promises to be a notable gathering. The purpose of Commissioner of Roads R. C. Terrell in calling the meeting was to effect an organization of the road engineers, to discuss road problems in all sections of the state and perfect the relations between the state and county road departments.

It is expected that all the road engineers and supervisors in the state and many county judges and members of fiscal courts will be present. All have been invited.

The sessions will be held in the auditorium of The Seelbach. During the sessions a buffet luncheon will be served the visitors by the Louisville Convention and Publicity League.

The more important features of the programme are as follows:

"The New Road Law and Its Application," by Commissioner of Public Roads R. C. Terrell.

"Road Oils and Their Effect," by a representative of the National Government.

"History of Road Building in Kentucky," by H. M. Crump, Bowling Green.

"Construction and Maintenance of Earth Roads," by S. H. Kimmel, Henderson.

"Gravel Roads," by M. A. Wilson, Marion.

"Convict Labor for Road Building," by Senator Joseph Bosworth, Middlesboro.

"Good Roads and Their Relation to Agriculture," by Commissioner of Agriculture J. W. Newman.

"Highway Bridges," by State Highway Engineer A. N. Johnson, Springfield, Ill.

"The Construction of Macadam Roads," by Guthrie Wilson, Bardstown.

"Maintenance of Macadam Roads," by W. H. Edwards, Jr., Versailles.

"The Practical Construction of Concrete Culverts," by J. R. Thompson, Paducah.

"The Feasibility of Macadam Roads for the Mountains," by M. G. Sullivan, Williamsburg.

"The County Organization," by J. R. Gaines, Louisville.

"Prospects of National Aid in the Building of Roads," by Pendleton Beckley, president Lakes-to-Gulf Highway Association.

* * *

Missouri.

Among the good roads bills presented to the legislature of Missouri are noted the following:

Appropriating \$460,000 from the general revenue to be appropriated among the counties and St. Louis for dragging roads. Each county to receive \$2,000 each year, providing it puts up as much more for the permanent improvement of highways and drags at least five miles.

If road dragging is impossible then the money can be used for permanent rock and similar material roads or for steel or concrete bridges.

Counties with an assessed valuation of less than \$4,000,000 are only obliged to set aside half of the permanent road fund to receive their share. The bill is that of Senator Carter.

To provide a system of dragged roads to connect all county seats and form one general system. This bill was introduced by Senator Hawkins of Dunklin.

The following are the special road district measures of Senator Craig:

One provides for an apportionment at intervals of the tax collected from dramshops and pool and billiard halls by the county courts, to the road funds, with an emergency clause.

Special road district commissioners are employed in another to construct bridges and culverts out of available funds. County courts can also do the same or assist the commissioners.

The statute relating to levy of road taxes is amended by providing that the assessment cannot be more than 20 cents or less than 10 cents on the assessed \$100 valuation in special road districts.

County courts to set aside part of the special taxes collected as "the special road and bridge fund," but only in counties with special road districts.

The joint resolution of Senator Carter providing for an annual tax of 10 cents, state wide, on each \$100 of assessed valuation, to raise money for the permanent construction of roads, passed without much opposition. Under the measure a constitutional amendment on this proposition is to be submitted at the next general election.

The bill of Senator Hawkins to create a county highway board of three members in each county to work

convicts of the county and state on the roads was defeated by 17 to 10.

* * *

New York.

John A. Hennessy, executive auditor, has been appointed a special commissioner by Governor Sulzer to investigate the Highway Department. Mr. Hennessy, who will serve without pay, will have power to subpoena witnesses, examine them under oath and call for all books and papers of the department.

The appointment means that the Governor intends to make a thorough house cleaning in the department. Mr. Hennessy has made a preliminary investigation, and it is known that he has discovered illegal contracts. It also appears that there has been a combination of republicans and democrats, a sort of bipartisan arrangement.

Favored contractors, it is believed, were able to step in and take away from successful bidders part of the contract for road building. Governor Sulzer intends to prosecute where there is sufficient evidence of criminality.

* * *

Ohio.

Contractors, engineers, inspectors, county commissioners and others interested in good roads, to the number of sixty were in attendance at the winter course in highway engineering at the Ohio State University, which ended March 8. In addition, the students in the regular courses in engineering at the University, took advantage of this special instruction, which consisted of lectures by noted highway experts and demonstrations of methods of road construction. This winter course, the first of its kind ever held in the state, has been a decided success, surpassing the expectations of those who planned and inaugurated the movement. The Ohio Good Roads Federation provided the money for this initial course and the legislature has been asked to appropriate money to continue the work next year.

Ohio is among the first of the states to give special instruction of this kind. It is interesting to note in this connection that the regular course in civil engineering at the University affords an excellent training to those who wish to become highway engineers, as it gives instruction in the fundamentals of road and street building, in highway structures of stone, concrete and steel, in highway surveying, and highway materials. In addition, those who wish to specialize have the State Highway Testing Laboratory at hand for testing materials in advanced investigations, and have the opportunity to engage in practical highway construction in summer vacations instead of going to camp. Former students are now holding responsible positions in highway departments of both New York and Ohio.

Ohio is determined to have good roads. The legislature of that state has just passed the Hite bill to raise \$3,500,000 annually for the improvement of inter-county roads and ten main market roads covering the state. The bill was introduced in the house by a democrat as part of the administration program, and passed by a vote of 91 to 22. The bill, provides for an annual tax levy of one-half mill from 1913 to 1922. Seventy-five per cent. of the annual revenue from the levy will go into the highway fund for the construction of the inter-county system of roads. Each county will receive each year \$30,000 to be expended by the state highway commissioner. If the lib-

eral use of money can pull Ohio out of the mud, it's going to be done.

* * *

Pennsylvania.

The Quaker State is preparing to reorganize its system of building and maintaining dirt roads in remote country districts. A bill has been introduced in the house of representatives by Representative Gibson, of Lyecoming county, that has the backing of the farming interests of the state and will doubtless become law.

The bill was prepared by E. E. Jones, of Susquehanna county, chairman of the committee on roads and an authority on the subject, after a careful study of road legislation in New York and other states. The bill was submitted to William T. Creasy and other leaders of the state Grange and has their indorsement.

The vital point in the bill is state aid to the townships, and this feature is not new, but was the purpose of the first "Jones dirt-road act." The actual money, however, has not been fully appropriated, and at present there is due the various township of the state over \$3,000,000.

The objection, heretofore, on the part of state officials has been that the state did not have proper supervision of the money given by the Commonwealth. This new act removes this objection by establishing in the State Highway Department a bureau of township roads, with a deputy highway commissioner at its head, and this bureau will devote its whole attention to the more than 80,000 miles of township roads in the state.

By the provisions of this act the supervisors of each county will meet and choose a county superintendent of roads, who will be representative of the state Highway Department, and direct and advise the township supervisors in their road work. This has been the weak point in the past. The town supervisor has often been inefficient, and it is hoped under this new plan to so aid him in his work as to obtain more intelligent effort and more permanent results.

The state aids the township to the extent of 50 per cent, not to exceed \$20 per mile, this feature being the same as heretofore.

* * *

Texas.

A record kept on good roads bond elections in Texas by the Texas Commercial Secretaries and Business Men's Association shows there were three held during February resulting in \$1,100,000 being voted for highway improvements, while four elections involving \$285,000 were defeated at the polls during the month.

The commissioners courts in ten counties have set dates for future elections to vote upon a total of \$1,410,000. Road districts in Atascosa, Frio and Harris counties were the progressive communities to vote favorably upon the good roads bond issues, Harris county alone carrying a \$1,000,000 issue by an overwhelming majority. The necessary two-thirds vote was lacking in elections held in Lavaca, Callahan, and Eastland counties, two elections being held in the latter county during the month. Organized efforts are under way in the counties where the issue met defeat to submit the question again.

At a mass-meeting held at Livingstone, Texas, last month it was decided unanimously to ask the commissioners' court to call an election to determine whether or not bonds in the sum of \$200,000 shall be issued for the building of good roads in Precinct No. 1, Polk county.

Tampa, Florida



Trinidad Liquid Asphalt

has all the stability of the lake asphalt, of which it is a primary form, that in the course of centuries becomes the more solid asphalt of the lake's surface.

Trinidad Liquid Asphalt contains no paraffin; it does not "bleed"—i.e., cover the road surface with sticky particles or pools. It stays in the road, and so perfectly incorporates with the mineral aggregate that repeated applications build up a durable bituminous surface.

With ordinary "road oils" successive applications are required to replace something that has entirely passed away.

Trinidad Liquid Asphalt is a permanent constructive agent; it is not merely a temporary dust layer.

Made in two grades: Trinidad Liquid Asphalt A—for use cold. Not only prevents dust, but forms a waterproof surface for macadam and dirt roads.

Trinidad Liquid Asphalt B—for use hot. Constructs an inexpensive, lasting surface for existing roads, forming a true asphaltic surface coat, which holds the road together and prevents dust.

An illustrated booklet tells the whole story of Trinidad Liquid Asphalt in a few plain words. Send for it.

ROAD DEPARTMENT

**The Barber
Asphalt Paving Company**

Philadelphia, Pa.

Offices in All Principal Cities

GOOD ROADS NOTES IN BRIEF

Lee district of Accomac county, Virginia, has voted to issue \$10,000 of bonds every year for five years for road building.

Midland county, Texas, votes this month on \$50,000 of road bonds.

The city of Parkersburg, West Virginia, will vote soon on \$200,000 of bonds for street work.

On the 22nd of this month, Mercer county, West Virginia, will vote on a bond issue of \$800,000 for road improvement.

Union City, Tennessee, will vote on \$30,000 of bonds for street paving.

The Park Commission of Atlanta, Georgia, has contracted for treating 30,000 square yards of macadam road with the "Finley Method."

It is announced from Culpeper, Virginia, that the state roads commission has awarded contracts for 7 miles of macadam road.

Meridian, Mississippi, is to use the Finley Method on five miles of macadam streets.

Tuscaloosa, Alabama, has \$100,000 available for laying asphalt pavement.

The city of Charlotte, North Carolina, will pave streets in Elizabeth Heights at a cost of about \$6,000.

The state highway commission of Virginia is asking for bids on 37½ miles of top soil road and 6½ miles of macadam near Danville, Virginia.

Commissioners of Beats No. 1 and No. 3, Forrest county, Mississippi, are arranging for building 50 miles of roads.

Paragould, Arkansas, will spend \$100,000 in building 40,000 square yards of streets.

The city of Shreveport, Louisiana, has available \$180,000 for 30 miles of gravel streets.

The police jury of Caddo parish, Louisiana, will grade, drain and gravel or macadamize twenty-five miles of roads.

Twenty one miles of the valley turnpike near Staunton, Virginia, is to be resurfaced at a cost of \$20,000.

The city of Staunton, Virginia, will spend \$60,000 this year in street improvement.

The growing city of Waycross, Georgia, will pave 20,000 square yards of streets with brick, bitulithic or sheet asphalt.

Grimes county, Texas, is asking for bids on 8 miles of macadam and 30 miles of sand clay roads.

Pickens county, Alabama, will grade 4 miles of road at an estimated cost of \$4,000.

Fort Bend county, Texas, is asking for bids on 15 miles of gravel road.

The city of San Antonio, Texas, is spending \$15,000 in improving Denver Boulevard.

The commissioners of the District of Columbia will spend \$100,000 in resurfacing and repairing streets.

Davidson county, North Carolina, votes on a bond issue of \$300,000 on April 22.

The city of Athens, Georgia, has voted bonds for \$75,000 for street improvement.

Road District No. 1 of Nueces county, Texas, has voted bonds for \$100,000 to build 50 miles of macadam road.

Navarro county, Texas, takes a long step forward by voting \$400,000 of bonds for building a system of roads.

The First Road District of Ascension Parish, Louisiana, has voted \$50,000 for road-building.

It is announced from Fulton, Mississippi, that Ita-

wamba county will issue bonds for \$65,000 for permanent road work.

Meridian, Mississippi, voted recently to issue \$25,000 for additional street improvement.

On May 10th. Third Ward of East Baton Rouge Parish, Louisiana, votes on a three mill special tax for building gravel roads.

Highland Park, one of the suburbs of Richmond, Virginia, will vote soon on a \$50,000 bond issue for paving streets.

Kyle Precinct, Hayes county, Texas, votes this month on a bond issue of \$100,000 for road building.

Justice Precinct No. 1, of Polk county, Texas, votes on the 26th of this month on a bond issue of \$200,000 for building a fine system of roads.

On May 13 the city of Miami, Florida, will vote on a bond issue of \$65,000 to pave several streets.

Mt. Airy township, Surry county, North Carolina, votes on the 17th of this month on a bond issue of \$80,000 for roadbuilding.

Spartanburg, South Carolina, is preparing to vote \$100,000 of bonds for street improvement.

An election is scheduled for the 15th of this month to vote on the question of issuing \$32,000 of bonds for paving streets in Tallahassee, Florida.

Hillsboro county, Florida, the county in which Tampa is situated, will vote soon on a bond issue of half a million dollars, the proceeds to be used in constructing a system of brick roads.

On May 27th, New Hanover county, North Carolina, will vote on a bond issue of \$100,000 for building roads.

Rome, Georgia, has contracted for asphalt paving to cost in the neighborhood of \$12,000.

The city of Cleveland, Oklahoma, has awarded contracts for paving eight blocks at a cost of about \$40,000.

At Kansas City, Missouri, a contract has been awarded for paving with creosoted blocks 75,000 square yards around the new union passenger station and over 13 viaducts. The cost will be \$225,000 and it will be borne by the Kansas City Terminal Railway Co. It will require five million blocks.

Darlington, South Carolina, is to have 18,000 square feet of sidewalk constructed.

Proposals are being asked at Towson, Maryland, for the construction of 50 miles of state aid highway.

Morristown, Tennessee, will let contracts on the 18th of this month for 15,730 square yards of guttering and paving with sheet asphalt.

WALTER WILSON CROSBY

Member Am. Soc. C. E.

CONSULTING ENGINEER

HIGHWAYS

1431 Munsey Building, BALTIMORE, MD.



Improved Wood Rock Drills

There are 26 Wood Rock Drills working in the great Culebra Cut on the Panama Canal. They are there because the first one sent proved its worth. The Drill good enough for the Culebra Cut should be good enough for you.

Wood Drill Works

30 Dale Ave., PATERSON, N. J.
Agents: Baskerville & Co., Title Guarantee Bldg., Birmingham, Ala.
E. F. Craven, Greensboro, N. C.

THE WHEELBARROW AND ROAD UP-KEEP.

If the rural mail routes of the United States total 1,100,000 miles in length, how many wheelbarrow patrolmen will it take to keep these roads in good condition?

That is the problem which Jonathan Bourne, Jr., former senator from Oregon, has undertaken to solve this summer, and without charging Uncle Sam for his services.

Bourne was made chairman of the joint good roads committee of Congress. His salary as senator was cut off March 4.

He has learned from French engineers that wheelbarrow patrolmen are the secret of economy in the upkeep of rural highways. A shovel and a barrow are all the equipment necessary.

Senator Bourne has written to all of the 42,000 rural mail carriers in the United States for a detailed report as to the length and character of road they cover. From state engineers he is securing data on the cost of construction and of maintenance.

When Congress meets next December the joint committee will be ready to report a complete plan of highway construction and repair.

"The pretense that it would overwhelm the Treasury to engage in the building of roads is no more true in Congress than in the State Legislatures. If one will overwhelm the National Treasury so the other will overwhelm the State Treasury. Go where we will the difficulty is the same."—A. Lincoln.

EMERSON Road Building Machinery



Over sixty years experience in building road-making machinery enables us to meet *modern* requirements with machines *correct* in design, material and construction.

The **PEERLESS ROAD ROLLER** is efficient in every respect. Patent front truck, easy to turn.

Easy steamer. All steel bearings. Narrow width. Short wheel base. Made in 10 and 12-ton sizes.

Our **REEVES ROAD ENGINE** is the simple double cylinder style in 16, 20, 25 and 32 H. P. sizes. Solid, substantial, powerful. An honest performer on the heaviest work. Economical fuel consumer.

Our **BIG FOUR** 30 H. P. FOUR CYLINDER and 45 H. P. SIX CYLINDER Gas Tractors are also efficient road engines. Their immense drive wheels and four and six cylinders give enormous and steady pulling power.

Write for catalogs today on the Peerless Road Roller, the Reeves Steam Engine and the Big Four Gas Tractor



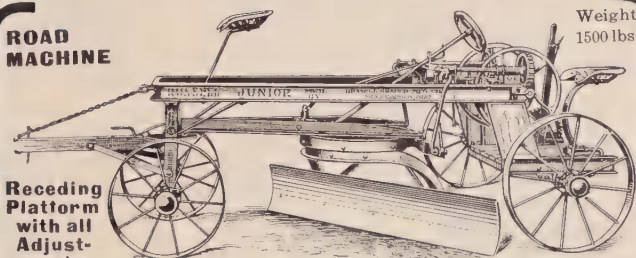
Emerson-Brantingham Implement Co., Inc.

1450 Iron Street,

ROCKFORD, ILL.

RUSSELL JUNIOR

ROAD MACHINE



Weight 1500 lbs.

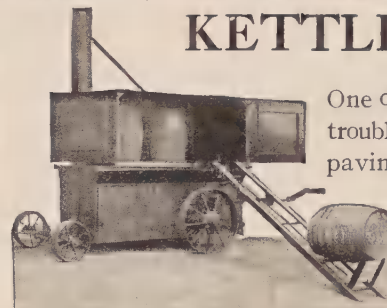
Receding Platform with all Adjustments

Complete in every detail and built on the lines of a larger machine. Ideal machine for light and ordinary road work for two or four horses. This type machine is also made in two larger sizes: "Standard" eight horse, 3000 lbs. and "Traction Special" for engine power, 3,500 lbs.

We make a complete line of earth handling machinery. Our 72 page catalog sent free.

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IROQUOIS HEATING KETTLES



One of a complete line of trouble-proof, long-service paving and road-making tools and machinery. Steam rollers.

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W. S. FALLIS, WILSON, N. C.

Civil and Highway Engineer

Highway, Bridge and Sewer Construction. Street Paving and Water Works

CHARLES H. HOYT, C. E.

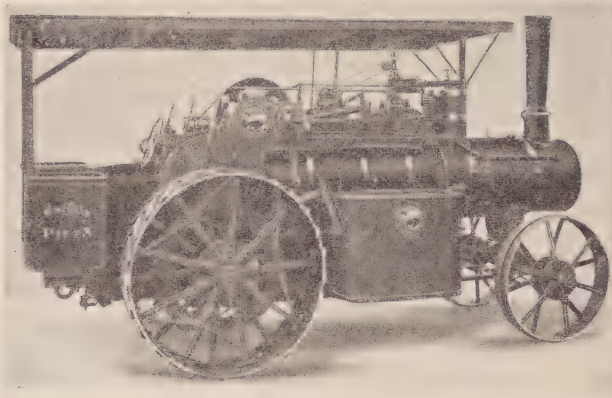
(Formerly U. S. Supt. of Road Construction and Bridge Engineer)

Highways and Bridges

Evans Building

WASHINGTON, D. C.

THE FEATURES OF A Road Locomotive THAT MAKE FOR SUPERIORITY



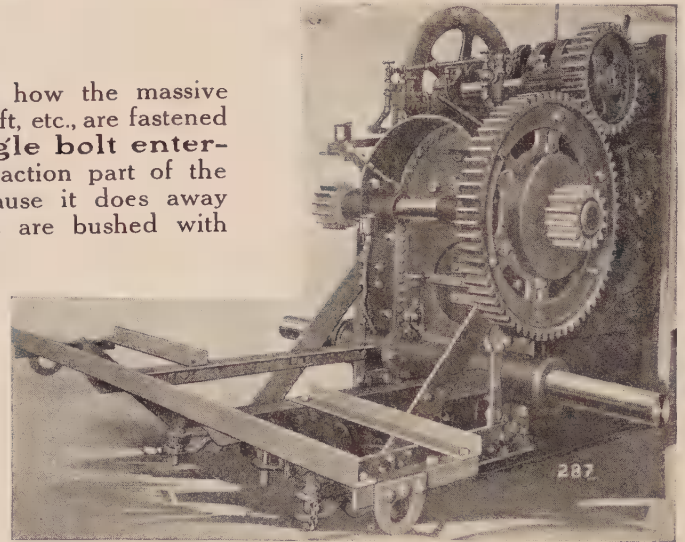
TWO SPEED LOCOMOTIVE

The Important Feature

The traction Mounting, illustrated herewith, shows how the massive steel rear axle brackets; the driving gears, countershaft, etc., are fastened to the extended part of the boiler **without a single bolt entering the water part of the boiler** from the traction part of the engine. All engineers appreciate this feature because it does away with leaky studs and bolts. All heavy bearings are bushed with Phosphor Bronze.



THE GREATEST TRACTION POWER



INDEPENDENT TRACTION MOUNTING

The Traction Wheels

Treads have tapered cleats that fit the wheel to the crown of the road. Cleats overlap in the middle to form a continuous bearing surface so that cleats do not cut finished road and at the same time exert the greatest amount of pulling power. Each cleat is fastened on by removable bolts so that the wide wheels, furnished with extensions, if desired, may be used for rolling. Extra heavy steel wheels with steel spokes fastened to the hub with extra large rivets. A steel spur gear is fastened to the rim of the wheel by heavy braces so that spokes are relieved of all driving strain.

Send for Our Art Catalog giving Full Particulars.

BUFFALO PITTS COMPANY

Haulage Outfits of Efficiency and Durability

BUFFALO, N. Y.

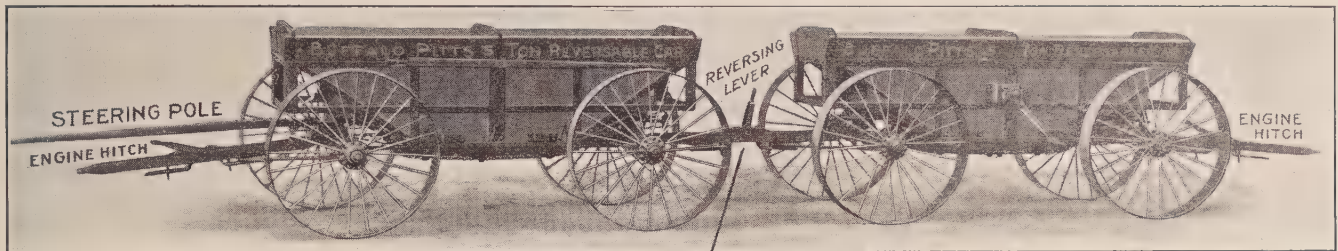
Branch Houses and Agencies in All Leading Centers



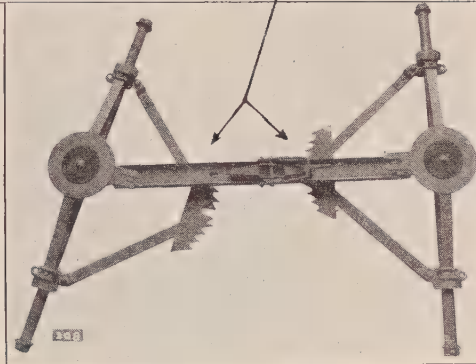
A Patent Reversible Road Car

THAT REDUCES COST ON ANY HAULAGE OPERATION

A Road Car to be efficient must not only follow the tread of the locomotive accurately but there must be a minimum of lost motion and ability to run forward or backward as desired.



The only Patent Reversible Gear of its kind, makes the car efficient in places where others are useless. So strong the train will not pull in two. So simple a boy can operate. The greatest time saver of the age.

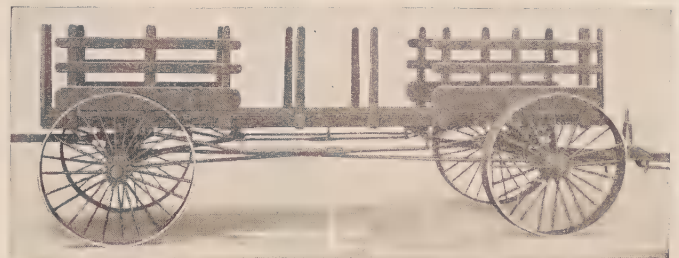


By simply throwing the reversing lever on the connecting hitch the train can be **reversed** to move either forward or back around the sharpest curves as well as in a straight line. Absolutely the only device where this is possible.

BUFFALO PITTS COMPANY

ROAD LOCOMOTIVES AND CARS

3½ yds. Patent Reversible Car Stone Spreading and Bottom Dump Styles, 5-ton size. Forged Steel Frame, steel wheels with special bronze bushings, special steel axles. 54-inch wheels with 8-inch tires. [Illustrated above.]



5 TON CONVERTABLE

6½ to 8 yds.---10 Ton Wooden Frame Car same features of construction as described in 5-ton size.

5-Ton Patent Reversible Freight Car Convertable, equipped with different bodies for brick, cement, asphaltum, oil in barrels, pipe, timbers or any kind of material. [As illustrated.]

All types of Buffalo Pitts Co. cars can be coupled in the same Train
Write for Art Catalog and Full Particulars

BUFFALO PITTS COMPANY

Haulage Outfits of Efficiency and Durability

BUFFALO, N. Y.

Branch Houses and Agencies in All Leading Centers



GOLDEN OPPORTUNITY.

Good roads pay.

* * *

Ask the people of California.

* * *

They bring tourists. Last year 35,000 foreign autos took out licenses and toured California.

* * *

Conservative estimates place the money these tourists left in the state at \$17,500,000. That is allowing only \$500 to the car.

* * *

Ask the people of Colorado.

* * *

Though Colorado's system of roads is still very incomplete, 6,000 foreign cars took out licenses and careful estimates place the money left in the state by their occupants at \$2,700,000.

* * *

In good roads lies an opportunity for the Southern Appalachian region.

* * *

With mountain scenery far more beautiful, blessed with a wonderful climate, accessible to the centers of wealth, nothing but bad roads stand in the way of the same golden tide that is adding millions yearly to the wealth of Colorado and California.

* * *

Tourists are willing and anxious to come.

* * *

When will the south wake up?

Studebaker

It matters not whether you select a flusher, sprinkler, sweeper, oiler, dump wagon or any other vehicle built by Studebaker, you can rest assured it embodies the latest developments in that particular field. And it is not only up to the minute in design and purpose, but it's built right—it's dependable.

We Build Sprinklers, Sweepers, Pneumatic and Power Flushers, Distributors for road building and dust laying materials, Garbage Wagons and Carts, Bottom Dump Wagons and Boxes, Street Cleaners' Carts, Vehicles, Harness, Automobiles. Catalogs and complete details upon request.

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SEWER PIPE**
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VITRIFIED TERRA - COTTA PIPE
for Road Culverts---Not only the BEST, but the CHEAPEST. Why pay one to three hundred per cent more and get less value? Hard burnt vitrified shale rock pipe *cannot* disintegrate. Has any other culvert been tried long enough to prove that fact?

Our new shale Pipe is unsurpassed in quality and strength. It is used exclusively by North Carolina Counties where highway improvement has long been under way. Prices on application.
POMONA TERRA COTTA CO., Pomona, N. C.

Annual capacity 1900 Cars

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are made by using UGITE

UGITE has been successfully used on every type of road construction and is prepared in six grades, for hot or cold application, to meet varying conditions or methods of treatment.

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Write for explanatory booklets today.

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The 1913 Good Roads Year Book

INVALUABLE TO LEGISLATORS, ENGINEERS, CONTRACTORS, ROAD AND STREET OFFICIALS, and all who are in any way interested in the increasingly important subject of road improvement in the United States.

Contains chapters on: Digest of state road laws; the use of convicts on the public roads; bond issues; mileage; appropriations, directories of state highway officials, manufacturers, contractors; types of roads; full lists of books, documents, periodicals, etc., dealing with the road subject; and a great deal of other valuable information.

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The Highest Class Asphaltic Oil



State Model Highway Between New Iberia and Jeanerette, Louisiana
80 Per Cent. Adeline Sunset Road Oil Used

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NEW ORLEANS, LA.



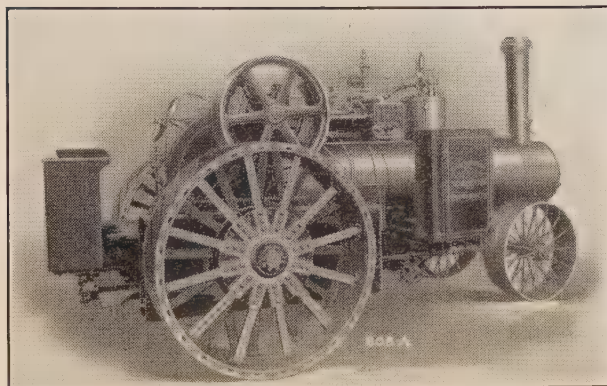
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REG. U.S. PAT. OFF.

THE ROMAN ROADS improved with age. This is likewise true of glutrin roads, and should be, since the underlying principle is the same in both.

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Team hauling costs 26 cents per yard per mile.
Frick steam engine hauling costs 7 cents per yard per mile.
The team is uncertain, of limited capacity and endurance.
The Frick hauling engine is ready for constant service throughout either a 10, 20, 24 hour day.
No cost for maintenance when not working.
Hauls over any finished road without damage.
Inquire about our Patent Fill Price on Driver.

Let us quote prices on an engine suitable for your work.

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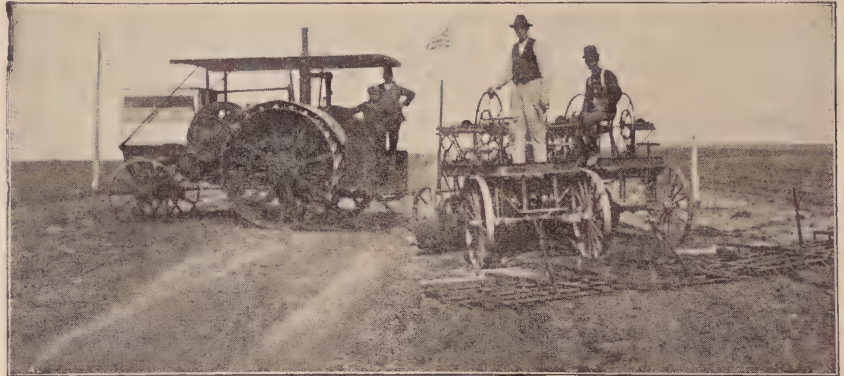
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I H C Oil Tractors make valuable savings. They save on fuel because they burn the smallest possible quantity of the cheapest fuel oils, and use fuel only when actually working. They save time because they work without stops for adjustment and without fuel, water, or the raising of steam pressure. They save on the payroll because fewer men are required and for shorter periods of time on each job. They save forfeitures for delay on contracts and earn bonuses for work completed ahead of time.



BUY AN I H C OIL TRACTOR

It saves money, time and labor because it is built for nothing but work. All the efforts of the designers and builders have gone into making it a dependable machine, one that will do a creditable job and always do it on time. Whatever style or size you need is here. We have one type in particular that is a favorite with road builders---a convertible road roller tractor that can be changed from a tractor to a road roller or back again in a half hour's time and without the use of special machinery.

Other types are made in 12, 15, 20, 25, 30, 45, and 60 H. P. sizes, operating on kerosene or gasoline. I H C general purpose engines, for use in shop, mill, or on the farm, are made in 1 to 50-H. P. sizes, to operate on low or high-grade fuel oils. Interesting catalogues describing the complete line will be mailed upon request. Address your letters to

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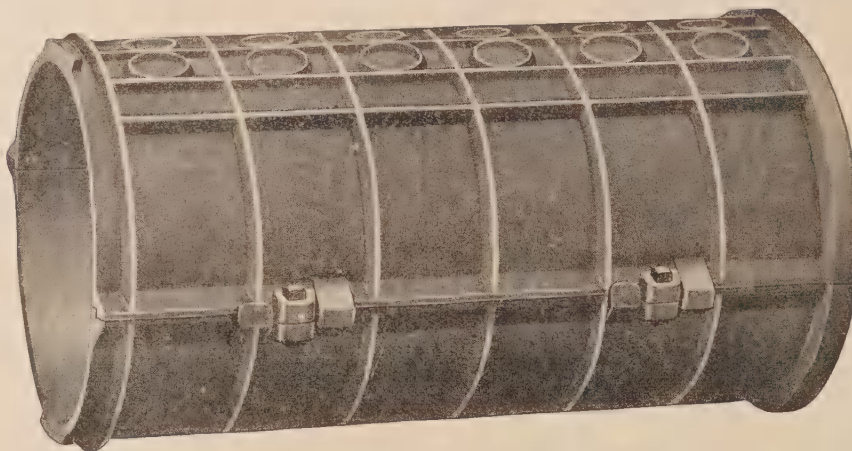
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The "PANAMA ROUND"

CAST IRON CULVERT PIPE

Fully Warranted

Has all the good features of any Iron Pipe, and a great many which no other make of pipe has.



Note the following points as shown on the cut:

The **double joint flange** where the half sections come together

The **lugs on end of pipe** for interlocking. Lugs on bell end do not show.

The **lugs on the side** for fastening the two half sections together.

The **general design** of the **ribs**.

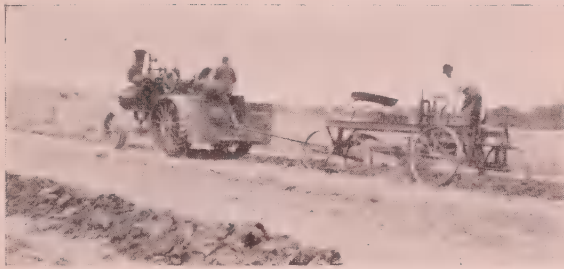
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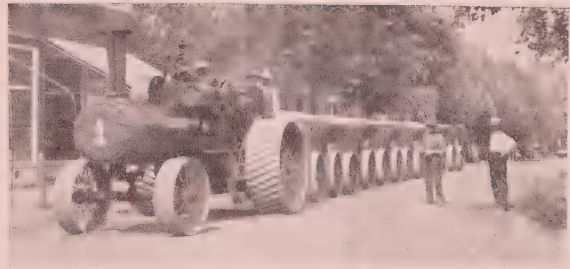
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Why not make a profit on every job? There's no reason why you should lose money.

High maintenance costs and small capacity eat up your profits. If you are working under such conditions you are not getting all that you are entitled to.

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J. I. Case T. M. Company, Inc.

711-761 State Street

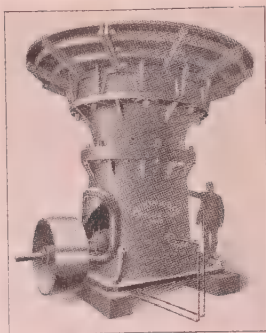
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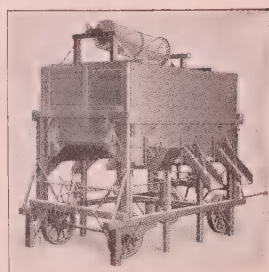




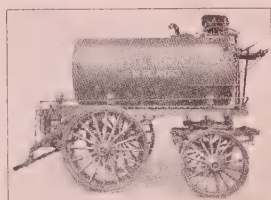
Austin Gyrary Crusher



Aurora Rock Crusher



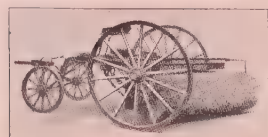
Aurora Bins and Screens



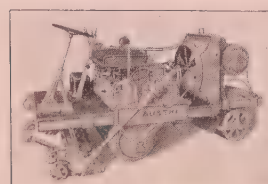
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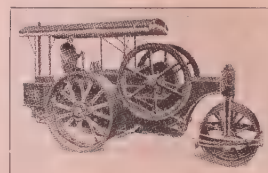
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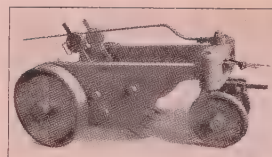
New York City
St. Paul, Minn.
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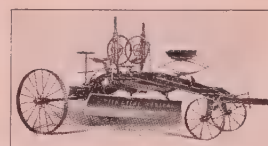
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San Francisco and Los Angeles, Cal.



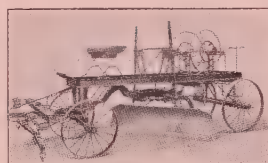
Austin Motor Roller



Austin Scarifier



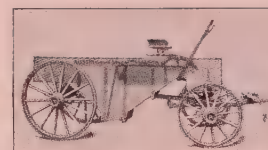
Little Western Grader



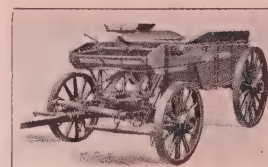
Western Grader



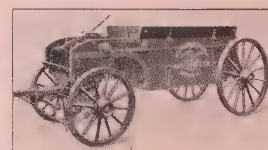
Austin Grader



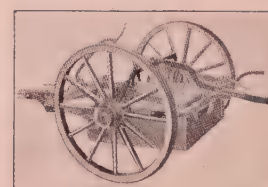
Austin Stone Spreader



Aurora Dump Wagon



Austin Dump Wagon



Western Wheeled Scraper

SOUTHERN GOOD ROADS

A MONTHLY MAGAZINE DEVOTED TO HIGHWAY AND STREET IMPROVEMENT

Vol. VII. No. 5.

Lexington, N. C., May, 1913

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CANAL ROAD, CUYAHOGA COUNTY, OHIO

This Road is Built of Brick, Fourteen Feet Wide, on a Four Inch Concrete Base With Sand Cushion. Cement Filler and Concrete Curbs

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LEXINGTON — NORTH CAROLINA

STANDARD

Asphalt Macadam Binders and Asphalt Road Oils



Morehead Ave. and Duke Street, Durham, N. C. Treated With Standard Asphalt Macadam Binder

STANDARD ASPHALT BINDERS are made in three grades, "A," "B" and "C," for use under varying conditions of road maintenance and construction.

These products are absolutely pure, containing 99 per cent. bitumen, and can be manufactured to any consistency desired. The three grades "A," "B" and "C" will be found to solve all problems of road surfacing or road construction that are ordinarily met with.

BINDER "A." A semi-solid product to be applied hot over stone or gravel roads subjected to heavy automobile travel. A covering of sand or screenings is necessary after Binder "A" is applied.

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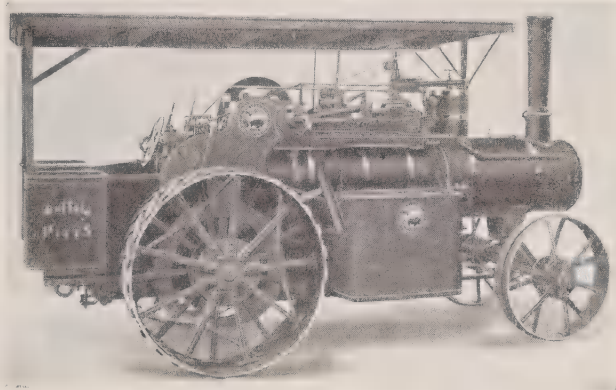
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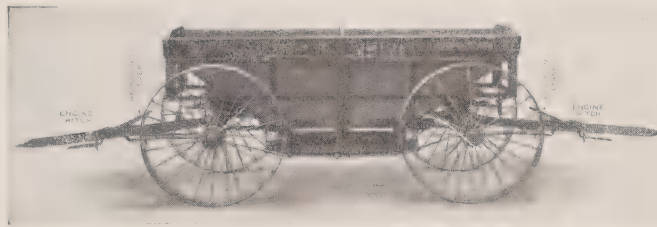
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For Teams, Traction
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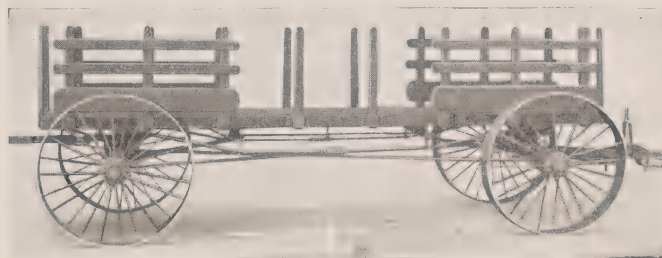
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National Highways

By CHARLES HENRY DAVIS, C. E.

President Pro Tem National Highways Association

THERE have been a number of attempts made to gain the united support of all Good Roads organizations for the attainment of an agreed program for legislation by the National Government. Such efforts have, so far, proved unsuccessful.

The Speaker of the House of Representatives, Champ Clark, over a year ago expressed in a few well-chosen

disposed to take any very definite action. The problem is, how are we to get together? This is easy to ask. Many people seem to find it hard to answer. But is it really hard? Let us see.

First, consider the elements that must co-operate. Obviously the forty-eight (48) state governments must agree. These states have forty-eight (48) governors and nearly one hundred (100) Highway Commissioners or State Highway Engineers. There are also about fifty (50) major Good Roads or Allied Associations whose management constitutes one thousand (1,000) or more individuals actively interested in the work. We also have about seven thousand five hundred (7,500) state senators and representatives who will have an important voice in the problem. There are, in addition, some five hundred (500) state and local Good Roads organizations and an equal number of automobile clubs devoting most of their activities to the movement; their management is represented by over ten thousand (10,000) persons. There is also a small army of county commissioners and superintendents, county judges, township supervisors, and other road officials, numbering between seventy-five and one hundred thousand persons. They are interested and active, and their influence will be a powerful factor. All those enumerated represent those in active participation in the control of good roads, their building, maintenance, and development. The total membership they represent is, of course, many times greater.

It looks like something of a task to devise a plan that will gain the co-operation of so many. Can it be done? If the seventy-five (75) odd road bills before congress are any criterion, the outlook is dubious for co-operation and agreement. If the attempt of four leading road organizations to hold an American Road Congress in 1912 is likewise a criterion, the outlook is even more dubious. They fell apart before they fairly got started. If so-called conventions held by one organization, ostensibly to gain the co-operation of all other road associations, are to be considered a criterion, we are far from the time when agreement and co-operation can be gained. Such conventions were fore-ordained, and their conclusions subsequently changed at the will of executive committees. Such methods do not represent an earnest desire to get together in support of a plan. They do, however, represent the wish to dominate and control. The trouble is not the magnitude of the task, or its many elements, but the personal ambitions of individuals. Such ambitions are not likely of satisfaction until set aside for the com-



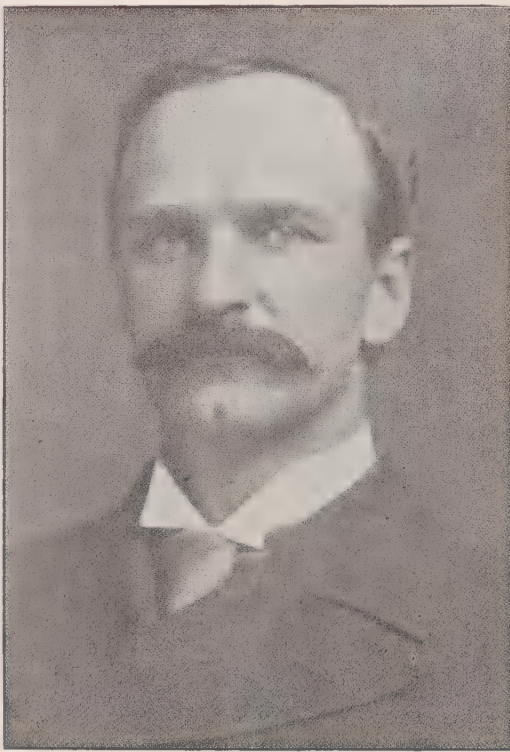
CHARLES HENRY DAVIS

President Pro Tem and Founder of the National Highways Association

words the history of most attempts to get congressional action in any given direction. "Get together" was the substance of his speech. Until those desiring a given action combine and agree on a program, congress, as representing the people, will await that time before giving serious attention to any plan. The majority leader in the House of Representatives, Oscar W. Underwood, of Alabama, voiced the same thought. They are right. Until those interested in road development unite on a given program Congress will not be

mon end—Good Roads. Good Roads are not likely to come apace until a plan to hasten them is devised and personal ambitions subordinated in a willingness to support and push this plan. It seems reasonably obvious that we must have a plan. How shall we get one, and can we agree on it when found?

There have been several so-called Good Roads conventions. The work to organize them and to make them successful has been arduous. The men who have done this work are deserving of much praise and entitled to the thanks of all good roads advocates. Such gatherings are, however, more accurately described as meetings. None of them has been worthy of the greater title. Most of their limited attendance has been confined to the membership of the association holding the meeting. Such others as attended came from the state in which the meeting was held. The press has given no substantial, wide-spread national



GENERAL COLEMAN DU PONT
Chairman Board of Councillors of the National Highways Association

publicity to them. They have had no exhibits commensurate with the greatness of the industry, or the annual expenditures on the roads of the nation. These meetings have been held by individual organizations to the exclusion of others, and, primarily, for the benefit of the association holding them, instead of the Good Roads movement as a whole. These cannot properly be called conventions. They suffer in comparison with the steam-railroad world, the street-railway industry, or the gas, electric, and automobile activities. These hold real conventions. And yet roads and road building are greater and vastly more important and interesting to many more people than any one of the industries mentioned. That this condition should exist is not indicative of a desire to co-operate or to agree on a plan. And yet to get congress to act we must agree on a plan and we must support it loyally, or our work will be ineffectual. Again, how shall we get one, and can we agree on it when found?

There is no unkindly thought or criticism to be in-

ferred from the facts recited. Men have a right to strive towards the attainment of their ambitions. But it is only from the study of facts that a solution of any problem can be found. So long as any considerable number of the leaders in our various road associations stand primarily (publicly or privately) for their own individual advancement two results are inevitable—delay in road development and failure to gain their individual ambitions. The latter can come only as the outgrowth of the success of a cause and the loyal support thereof. Will such men see this great truth, or will history repeat itself in their eventful elimination when the plan is at last found?

We come back to the question: Can we devise a plan, and can we agree to support it?

The author has personally, or by inheritance, been identified, directly or indirectly, with road building for three generations, or substantially since roads (as such) were built in this country. Way back in the earlier history of our nation my grandfather became identified with road building. This commercial interest was maintained by his son, my father, and later was developed by me. Through this business connection I became active in the general Good Roads movement through the United States. A study of the needs of our people made it apparent that the National Government should participate in highway building. But how? Obviously, to me, through the building of a system of National Highways. But how convince the body politic that this was wise? Again obviously, to me, through the formation of an association devoted to such a cause. As a result of these thoughts the National Highways Association was founded. Shortly thereafter I became convinced that the best development of the association required independence from commercial road building, and I disposed of my business interests to that end.

Whether the National Government shall or shall not help in the construction of the highways of the nation is of vital and pressing importance to all our people. France, Germany, England, and, in fact, most European countries, have great highways. In the United States no such roads exist to any relative extent. We grew as a nation with the industrial growth of the world. About 1831, when we were young, railroads and street railways were first built. A little later came the telegraph, and then the telephone. We likewise had great rivers, such as did not exist in many other industrial nations. These five means of transportation had a tendency to confine our road building to local centers. In Europe the need of intercommunication came before the use of steam or electricity. Hence the earlier growth of road building on that continent.

We have over two million miles of highways in the United States. The excess over two million miles is, approximately, the only part of this vast system of roads which can be considered as improved—and these are not permanently improved. The cost of improving this two million miles can be estimated as somewhere between a minimum of six billion and twenty billion dollars or more.

The improvement of these highways will not come at once, either in time or, on first building, in permanence. Their history will be that of railroads—constant rebuilding and improvement. Add to either figure of cost what the imagination may choose to add and we have a future expenditure on the highways of the nation greater than the present investment in all other means of intercommunication—railroads, trolleys, telegraphs, telephones, horse and power vehicles, and the

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PROPOSED BY THE NATIONAL HIGHWAYS ASSOCIATION

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PRESIDENT PRO TEM.



MAIN HIGHWAYS

1. Northern
2. Central
3. Southern
4. Atlantic
5. Mississippi
6. Pacific

TRUNK HIGHWAYS

7. Appalachian
8. Canada-Gulf
9. Great Lakes-Atlantic
10. Great Lakes Gulf
11. Lake-Mountain-Pacific
12. Missouri-Arizona
13. Northwest
14. Oklahoma-Carolina
15. Puget-Gulf
16. Rocky Mountain
17. Santa Fe
18. Southwest
19. Texas-Atlantic

LINK HIGHWAYS

20. Atlanta-Aurora
21. Bismarck-Pierre
22. Burlington-Portland
23. Charleston-Savannah
24. Chicago-Columbus
25. Chicago-Detroit
26. Chicago-Mackinac
27. Chicago-St. Louis
28. Cleveland-Cincinnati
29. Columbia River
30. Connecticut Valley
31. Delaware-Chesapeake
32. Detroit-Grand Rapids
33. Florida West Coast
34. Harrisburg-Erie
35. Hartford-Scranton
36. Jefferson City
37. Louisville-Nashville
38. Louisville-Cincinnati
39. Maine-Quebec

LINK HIGHWAYS

40. Massachusetts-Vermont
41. Memphis-Florida
42. Nebraska-Texas
43. New Hampshire
44. New York-Scranton
45. Ohio-Wabash
46. Philadelphia-Atlantic City
47. Philadelphia-Buffalo
48. Pittsburgh-Cleveland
49. Pittsburgh-Cincinnati
50. Pittsburgh-Erie
51. Richmond-Charleston
52. Richmond-Norfolk
53. Salt Lake-Montana
54. Toledo-Mackinac
55. Utica-Ogdensburg
56. Washington-Annapolis
57. West Virginia-Indiana
58. Wisconsin

postal service. This expenditure will cover many years. If accomplished within the same period as our railroad development, then about eighty years. The wise planning and building of these highways is an important public duty.

In the early days road building was largely confined to the efforts of local communities—the villages, towns, and cities. Later developments brought about county roads, and then state highways. At first the town or county road official directed these improvements, sought the appropriations therefor, and controlled the



"At the Top of the Hill." Fine Sand-Clay Road, Near Carnegie, Oklahoma

work and expenditures—the state had no interest or authority. But this caused the growth of a disjointed system of roads which did not properly connect the various parts of the state; hence the creation of State Highway Commissions. There were other reasons for this. Large appropriations could be obtained from the state. Uniformity of construction and maintenance could be secured. Accentuation in town and county road improvement was not the least of the results obtained. The changed conditions have, in some cases, resulted in not only voluntary appropriation from counties and towns, but compulsory expenditure where the state authorities decided to build a state road. The local authorities thus lost control of state, but maintained control of local, roads.

Within the past few years there has been an ever-increasing demand for the National Government to join in road building, as the states have joined with the counties and towns. Of those who believe the National Government should enter this field of activity there are two schools of thought—National Highways and Federal Aid. The first stands for a system of national highways built and maintained by the National Government. The second stands for government appropriations apportioned among the states, to be spent on state roads.

In the Federal Aid class should be included those bills designated especially to cover rural free delivery routes. The development of such roads cannot be considered as creating a system of national highways, because they are only the outer fringe located in sparsely settled regions and disconnected from any possible system of national highways.

If we are to have federal aid, such legislation must follow one of two plans: either an outright gift of government funds, apportioned among the states, to be spent by them as they may deem desirable or government funds apportioned among the states, to be expended by the United States Government under prescribed regulations without interference from state authorities. Any middle course of joint authority over

location, design, and supervision means in substance and in practice the control by the United States authorities over all state roads upon which government funds are spent; or, in the attempt to prevent it, then conflict and failure or corruption.

Any national highways legislation must also, if enacted, follow one of two plans: either the building of certain specific highways, or the building of a system of national highways. The latter would bear to the state highways the same relation that state highways bear to county and town roads.

It is too early to arrive at a conclusion for or against either federal aid or National Highways legislation. The subject is one of the greatest material, economic, and social questions to be rightly solved by the nation. Material, because of the vast sums to be expended. Economic, because of the nation-wide reduction in cost of distribution which will be attained. Social, because of the opportunity and encouragement to the country folk to come in contact with their fellow men, women, and children—especially the last two. They can get this by no other means. Can any one looking at the illustrations believe otherwise! Such a great question should not be lightly decided. No large appropriation should be made without deep study and forethought—without knowing the way we should go and where we should land.

We need not discuss the merits or demerits of the various provisions of the road bills now before congress. They all have the fundamental fault of committing the nation to vast expenditures, followed by untold and unknown increases thereof. They would propose to do this with little knowledge in the hands of congress and without a just appreciation of the magnitude and importance of the problem. No such legislation should be considered until sufficient information is secured to enable congress to act intelligently and with a full knowledge of the whole subject.

People in general think they know the difference between a good road and a bad road. They want and need good roads. They think hard roads are good and



A Dustless Dirt Road at Greenwood, Mississippi. Oiled to Keep Down the Dust. Many Mississippi Towns Are Doing This

soft roads bad. This, however, is not the national problem. We do not now want to know what kind of roads to build, nor when, nor where. What we do want to know is whether or not the nation should help in road building. If answered affirmatively, then, whether we shall have legislation favorable to Federal Aid or National Highways, or both. And finally, when, where, and how. Wise action cannot come without wise study on the part of a representative and proper-

ly constituted commission. The vastness of the undertaking, its cost, its benefits or otherwise, far outstrip any other public work heretofore undertaken. We should move slowly and after due deliberation.

On the other hand, the National Highways Association stands for a plan—a system of highways, interstate in character, built and maintained by the United States Government.

The map of the association, herewith presented, gives an optical description of what we stand for. The locations are obviously tentative. Here is the plan! Effective! Logical! Definite! Has any one seen any other? If so, let us have it and know its advocates.



Beautiful Road Through a Beautiful Country. This Section of Limestone Macadam Lies Between Bristol and Blountsville, Tennessee

Can we agree on this plan? One devised by an association committed, for the time being, to its advancement! If we can, the growth of road building will be immediate and phenomenal. If we cannot, where is another plan?

If we have found the plan, how can we agree on it? Obviously, not by abandonment of our many and various road associations and all they stand for and the good they accomplish locally. Will these many and diverse interests affiliate with the National Highways Association and co-operate towards the accomplishment of our plan? Or will each insist that their particular organization shall take the lead? Or will a new, untried association get us together?

Co-operation is often obtained indirectly. As stated, we have seventy-five (75) or more road bills before congress. We have over one thousand (1,000) associations directly interested and actively identified with the Good Roads movement (not to include Boards of Trade, Merchants and Manufacturers Associations, etc., etc.) We have a congressional committee investigating the problem—with a totally inadequate appropriation. All this indicates that it is becoming generally recognized that road building and improvement will be of greater benefit to the nation and the people at large than almost any other national development. It is of vastly greater importance than the Panama Canal can ever be. Roads are free to the public. Their future development is as important to the people as railroads, telegraphs, telephones, or the postal service. They will be paid for by the people. They will be owned and used not by the few, but by all. Vast sums are to be spent upon them, and their wise planning and building are of the utmost importance.

The providing of various methods of intercommunication has for all ages been of paramount importance. Of all other methods, roads are the most universally used, and therefore the most beneficial to the greatest

number of people. Of the seven methods of intercommunication—water, roads, postal, railroad, telegraph, telephone, and wireless—only one is free to all the people of the earth. All these methods of intercommunication have been furthered and fostered by the National Government to a greater or less degree, while two of our great systems of transportation—railroad and steamship—have been aided by the national government with hundreds of millions of dollars and operated at a profit by and for a few favored individuals, and to which the entire community has contributed. The annual appropriations by congress now approach one thousand million dollars, distributed approximately as follows:

	Millions.	per cent of total
1. War—past, present, and to come	420	42
2. Postal service	230	23
3. Government—legislative, executive, foreign, customs, immigration, interest on public debt, etc.	200	20
4. Public Works—buildings, rivers, harbors, reclamation, forestry, public lands, Panama Canal, etc.	110	11
5. Education and Statistics—census, public printing, agriculture, surveys, public health and life, etc.	40	4
Totals	1,000	100

In the course of our national existence the total expenditures of the National Government on public buildings, rivers, harbors, reclamation, forestry, public lands, and Panama Canal have been several thousand millions of dollars. As stated, there are about 2,300,000 miles of roads in the United States, of which more than 2,000,000 miles are unimproved, and more than 90 per cent of the traffic on these roads is confined to less than 20 per cent of their length. A system of not more than Fifty Thousand Miles of National Highways (only about 2 per cent of the total United States road mileage) will give adequate interstate main, trunk, and link lines connecting each state with its adjoining



Fine Straight-Away Stretch of Sand Clay at Waycross, Georgia. One Year Old and Not a Cent Spent on It For Maintenance

states and, through them, with all other states of the Union.

To favor, foster, and further the development of National Highways in the length and breadth of these United States of America will secure the benefits—social, moral, commercial, industrial, material, educa-



A Section of Good Sand-Clay Road Near Jackson, Tennessee, Seven Hours After a Hard Rain

tional, and personal—in the progress and uplift of the American people which follow in the train of easy and free inter-communication and transit between the great centers of population and distribution and the great productive areas of the nation; and will “bind the states together in a common brotherhood, and thus perpetuate and preserve the Union.”

Such a system of National Highways will encourage and accentuate the building of Good Roads everywhere by states, counties, cities, townships, and towns as the collecting and distributing medium of these National Highways.

Our association believes in all this, and has faith that eventually the people of these United States will come to believe. Nevertheless, we feel, most strongly, that no plan should be determined upon until after a most thorough investigation and report on the part of a properly constituted commission with an appropriation sufficient to not only do its work, but to give adequate publicity thereto. Such publicity will not only crystallize public opinion, but likewise guide the commission itself in arriving at a wise conclusion. We have no doubt as to these conclusions supporting our plan. If not, it will be for good and sufficient reasons, carrying conviction to the body politic.

Substantially no great government work has been undertaken, or large appropriations made therefor, without a careful preliminary investigation and report to congress, thus enabling it to act wisely and with discretion. Why should the building of a system of National Highways—the greatest and most important of all—be undertaken with little or no knowledge before congress of the subject or its needs? The magnitude of the project is such, and many of its aspects are

so technical, that it cannot properly be considered in the first instance by a congressional committee; and to refer it to one of the regularly constituted executive departments would unduly burden such department and interfere with routine work, even assuming it was qualified. The wisest course would seem to be the creation of a special National Highways Commission to investigate the entire subject and report to congress at the earliest practicable date. Such has been the course pursued with all great public works, including the Panama Canal. We would have considered it absurd for a non-technical committee of congressmen to sit in Washington and commit this nation to the great national irrigation, the Sault Sainte Marie Canal, the vast river and harbor improvements of the nation, and finally five hundred or more millions for the Isthmian Canal. This is no reflection on the work of the present congressional committee, the results of which we do not yet know. It is an attack on the method. Before the nation was committed to any of these great public works expert commissions were created. They were given ample appropriations. They made surveys and reports from investigation on the ground. Various locations were considered in each case. Estimates of cost were prepared. Operating and maintenance charges were considered. Probable traffic and revenue therefrom were estimated. Why should not all this be done for highways before we as a nation are committed to either a system of national highways or Federal Aid so called? If National Highways, we want to know: “Where? How long? How wide? How built? What material? At what cost? What proportionate traffic will they carry? What will it cost to maintain them? How much will they reduce

the cost of transportation? How much will they increase land and other investment values?" But we could continue indefinitely! Can such investigation and a wise determination be arrived at except by an expert commission? We think not.

With this object in view, the following bill is suggested:

A BILL.

To Create a National Highways Commission and Prescribing Its Powers and Duties.

Be it enacted by the senate and house of representatives of the United States of America in congress assembled:

Section 1. That a commission is hereby created, to be called the "National Highways Commission," to investigate, collect information, and report to congress on the highways of the United States, together with recommendations as to the proper policy of the National Government in respect thereto (whether by the establishment of a system of National Highways or by Federal Aid in the building of state roads or otherwise) and as to the most appropriate legislation to carry such policy into effect.

Section 2. That the National Highways Commission shall consist of a chairman as the executive head in responsible charge thereof and thirteen additional commissioners as an "Advisory Council."

Section 3. That the president, by and with the advice and consent of the senate, shall appoint said commission as follows:

First: That the chairman shall be or have been an engineer by education and profession and shall be a man of executive and business experience.

Second: The chairman shall be selected from candidates nominated to the president, one by each of the following associations:

(Such as, the American Society of Civil Engineers, the American Automobile Association, the American Road Builders Association, the National Grange, Farmers Union, and any other representative National Associations specially concerned with highway development. In this section should also be suitable provision for the manner of making such nominations.)

Third: The thirteen members of the "Advisory Council" shall be respectively qualified to represent the following interests in the body politic: (1) Agriculture, (2) Commerce, (3) Construction, (4) Economics, (5) Education, (6) Engineering, (7) Finance, (8) Legislation, (9) Maintenance and Traffic, (10) Materials and Machinery, (11) Military, (12) Transportation, (13) Travel, Touring, and Recreation.

(This enumeration is merely tentative; the intention being to name all of the general interests of the country which are directly concerned in the development of a system of National Highways.)

Fourth: Vacancies occurring in the commission shall be filled in the same manner as hereinbefore provided for original appointments.

Fifth: Any member of the commission shall be subject to removal by the president for inefficiency, neglect of duty, or malfeasance in office.

Section 4. That the chairman shall receive a salary of _____ dollars per annum, and each other commissioner a salary of _____ dollars per annum.

Section 5. That the powers and duties of the Chairman shall be:

(In this section should follow an enumeration of powers and duties in sufficient detail to indicate the extent to which the commission is required to investi-

gate and to give the chairman the fullest possible power to carry out such investigation. The following points in particular should be covered:

- (1) Executive direction of work.
- (2) Appointment and removal of employees.
- (3) Providing offices, laboratories, etc.
- (4) Collection, tabulation, and publication of information; including experimental work, surveys, etc.
- (5) Obtaining information and co-operation from governmental departments.
- (6) Incurring necessary expense.
- (7) Preparing and submitting a complete final report with recommendations.)

Section 6. That the duty of the "Advisory Council" shall be to assist the chairman as he may direct and to advise with him at his request or on their own initiative.

Section 7. That the term of office of the commissioners and their successors appointed hereunder shall end upon the delivery of their final report to the president, but not later in any event than _____, 19____.

Section 8. That for the purpose of carrying out the provisions of this act, there is hereby appropriated the sum of _____ dollars, out of any money in the treasury not otherwise appropriated.

The bill above outlined is designed to accomplish the following main objects:

a) The gaining of complete and reliable information, within a reasonable time, as a basis upon which to determine a policy and to frame proper legislation.

(b) The gaining of this information through a broadly representative commission, whose work will necessarily evoke discussion and crystallize public opinion.

(c) The concentration of the authority and responsibility of the commission upon a single capable man, carefully chosen, subject to removal for cause, and ably supported by an "Advisory Council" representing all related activities (following therein the precedent which has proved so successful in the case of the Panama Canal.)

It is believed that congress will seriously consider and pass a bill which has the united support of those who believe in wise national legislation for the development of the highways of the nation. It is hoped that a bill drawn upon the lines suggested will prove worthy of such united support.

The result of creating such a National Highways Commission will be the co-operation of all road associations towards helping the commission to gain the facts, give them the widest publicity, and thus arrive at a wise conclusion in the interest of our ninety millions of people.

Will not the report of such a commission find the plan upon which we can all unite? We think so. Do you?

Reports from McLennan county Texas, announcing that one hundred and fifty split log drags were in operation in that county maintained jointly by popular subscription and appropriations of the commissioners' court are a tribute to the progressive spirit of that community as well as to the efficiency of the split log drag.

The drag has contributed more toward the economic maintenance of the public highways than any implement of modern usage. It does not require special acts of the legislature, bond issues nor expensive educational campaigns to make it available as usually precedes construction work. A drag can be built or purchased for twenty dollars and is easily operated by any one who can drive a team.

Bituminous Gravel Concrete Pavements

By SPENCER J. STEWART

Division Engineer in Charge Division No. 1, Department of Highways, New York State

THE CONSTRUCTION of highways can be placed under three sub-divisions: First, city pavements upon which there is heavy and congested traffic; second, village pavements upon which the traffic is more or less congested but not as heavy as in a city; third, suburban and country pavements, upon which the traffic is neither as congested or heavy as in cities and villages, but where the automobile can, within the law, travel at far greater speed.

In cities, the highway engineer is compelled to build that form of construction which will withstand heavy traffic conditions, and is justified in spending as great an amount of money as is necessary to produce the required results.

In villages, the engineer, although not justified in spending per square yard as much money as in cities, due to different traffic conditions, is justified in the expenditure of more money per square yard than the engineer who is attempting to solve the problem of an economical country highway.

A portion of the territory over which the writer has

jurisdiction could be called the suburbs of New York City.

The highways built eight or ten years ago in this territory were designed to take care of horse drawn vehicles and were water-bound macadam type of construction.

About four years ago, the general design of alignment, grade and wearing surface were changed to conform to the daily increasing automobile traffic and we substituted for the water-bound design the so-called penetration method of construction.

Today, the problem is not only to take care of the vehicle and motor car traffic, but also of the motor truck, which is fast increasing in use as a local freight carrier. This condition forces upon us the necessity of a comparatively more permanent pavement; namely, brick, asphalt block or some form of mixing method pavement.

Brick, asphalt block or a mixing method pavement covered by a patent is far too costly to pave even the main highways, taking into consideration the amount of



IN THE VILLAGE OF BABYLON

View of Cementitious Gravel foundation in the Village of Babylon on the Outskirts of New York City, Four Inches in Thickness, Constructed Under the Supervision of Engineer Stewart

money available for this work. As a result of this condition, the writer designed a pavement which he considered would withstand the traffic conditions and not

was 2 inches in its longest dimension, and containing sufficient fines to partially fill the voids.

The bitumen was a fluxed natural lake asphalt with a penetration between ten and thirteen millimeters



Mixture of Cementitious Gravel and Asphalt on the East Hampton-Sag Harbor Road, Near New York City. The Mixture Has Not Been Rolled.



This View Shows Laborers Raking the Cementitious Gravel and Asphalt on the East Hampton-Bar Harbor Road, Near New York.

infringe upon the patents granted to individuals or corporations and not be excessive in cost.

This pavement consists of a mixture of asphalt and gravel in the proportion of one cubic yard of loose gravel to an average of twenty gallons of asphalt, the gravel containing not less than ten percent of clay. The gravel is bank run, the largest particle of which

when tested for five seconds at seventy-seven degrees Fahrenheit on a No. 2 needle weighing 100 grams.

The gravel was heated in a mechanical revolving drier to a temperature of over 225 degrees Fahrenheit, after which the asphalt, heated to not less than 275 degrees Fahrenheit, was added and the mixture placed in a revolving mixer and thoroughly agitated until all



ON THE WHITE PLAINS-YONKERS ROAD

This View Shows the Mixture of Cementitious Gravel and Asphalt After Being Rolled With a 10-Ton Roller

particles were thoroughly and completely coated with the bituminous material. The mixture, at not less than 250 degrees Fahrenheit, was then spread upon the prepared bottom course by use of shovels from dumping boards and raked to a uniform surface with hot rakes, after which it was rolled with a self-propelled roller weighing at least 10 tons until thoroughly consolidated.

Upon this surface was placed one-half inch of gravel screenings, containing not less than ten per cent of clay, which was saturated with water and rolled thoroughly and continuously until a clay mortar had been obtained. This process filled all the surface interstices with a gritty and adhesive substance, which made the road practically "non-skid." The traffic in a short time drives away all surplus screenings, leaving a mosaic surface.

In constructing this pavement it is not considered expedient to have a small percentage of voids, thereby allowing the heat of the sun and the traffic to gradually consolidate the pavement, resulting in a comparatively smooth and even surface and avoiding the short wavy condition of pavements in which the mineral aggregate is fine and the bitumen in larger proportion to the mineral aggregate than in the above described specification. This theory has been substantiated in actual construction.

Gravel.

This gravel is composed of calcareous sandstone, granite and quartzite, associated with a considerable amount of finer particles of the above named rocks, together with a percentage of clay. This latter substance gives the gravel a good cementitious value, which is an essential to the comparative permanency of the pavement. The clay acts as a catalyzer on the asphalt, making it more viscous, less volatile and also less brittle.

The success of this pavement, in the writer's mind, is due to the physical qualities possessed by the gravel that was used as the mineral aggregate, the gravel being Hudson River Cementitious Gravel, of which there are many pits along the banks of the Hudson River and at least three that are developed commercially.

The nature of this material was brought to my attention, first by its general use on the parkway systems of New York City and many of the country roads on Long Island where it had been used very successfully as a water-puddled roadway until the advent of the motor vehicle.

It occurred to the writer that if it was possible to use this material and obtain similar results with an additional element in its composition that would insure its resistance to motor traffic, that it would be an economical and desirable result.

I believe it will be generally conceded that a gravel roadway, when in condition, is as desirable and as comfortable a roadway to travel upon, especially for country and park purposes, as any that have been presented to the public.

This composition of gravel and asphalt retains all the agreeableness of travel and also retains the appearance of the original gravel road. At the same time it has the added feature of comparative stability and resistance to wear of other pavements that could be justly classified as those belonging to a city or a populous village.

Pavements of a semi-permanent nature, now commonly used in cities and villages, seem somewhat out of keeping with the surroundings when placed upon park driveways or country highways, being noisy, hard and unattractive.

This mixture of gravel and asphalt overcomes all these criticisms by being comparatively noiseless, resilient, easy riding, and conforming to our ideals of



THE FINISHED ROAD

General View of the Yonkers-White Plains Cementitious Gravel Road After Completion. Built Under the Direction of Engineer Spencer J. Stewart of the New York State Highway Commission

what should be the appearance of a country or park driveway, and in addition to this it possesses a feature which not only the driver of a horse, but also the users of automobiles can readily appreciate, namely, that it has a "non-skid" surface.

Another feature of this pavement which has appealed to the writer is the lower cost as compared with other so-called permanent pavements.

The average price bid by contractors for a pavement $2\frac{1}{2}$ inches deep of this nature has been \$0.85 per square yard. From reports of engineers in immediate charge of the different contracts, the percentage of profit has varied from 0 to 15 per cent. On this basis I consider an engineer's estimate for this work should be \$0.85 or \$0.90 per square yard under similar conditions of accessibility to the materials that compose the pavement.

The cost of the mineral aggregate averaged \$3.25 per cubic yard on the site of the work.

The cost of the asphalt averaged \$0.15 per gallon on the site of the work.

On one road the contractor erected a central plant at the railroad station, involving a cost of about \$8000.

On another road the contractor made use of a portable plant costing about \$2200.00. This plant was designed to carry the mixture by means of an extending arm from the mixer to the place where the pavement was being laid. This necessitated a constant shifting of the plant.

Another contractor used a portable plant, moving it on an average of 1000 feet, and transporting his mixture by means of horse drawn steel carts.

This last method I consider the most satisfactory and economical.

Where the above described ingredients can be obtained, I believe this form of pavement to be worthy of investigation and consideration.

First on account of its comparatively low cost.

Second because of its adaptability to country and parkway purposes, due to the easy riding surface, and its conformity to our ideals of the surroundings of a parkway or country highway.

Third on account of its non-slippery nature, it being practically a "non-skid" road.

Examples of this pavement can be seen on Central avenue from the northerly line of the City of Yonkers extending northerly towards White Plains for $2\frac{3}{4}$ miles. In this case the pavement was placed upon an old macadam foundation.

On the south shore of Long Island in the village of Amityville, built upon a gravel foundation.

On the south shore of Long Island in the village of Babylon, built upon a gravel foundation.

On the road extending from East Hampton to Sag Harbor on Long Island, built upon a trap rock sand filled foundation.

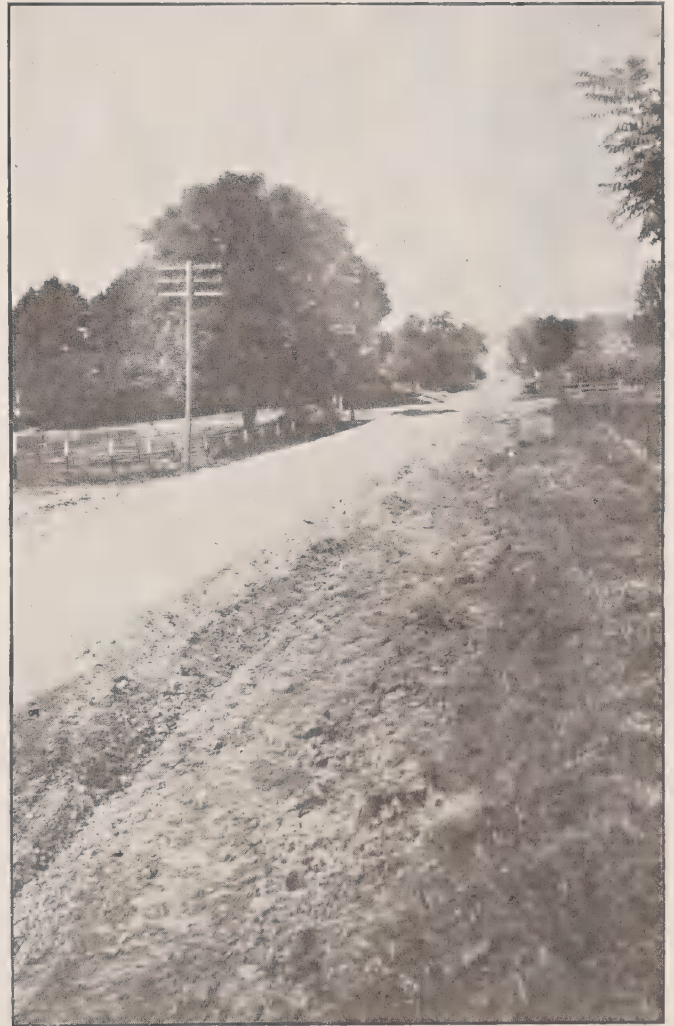
Question Constitutionality of Automobile Registration Tax.

The question of carrying to the highest court in the land the constitutionality of the automobile registration tax will be considered at the next meeting of the executive board of the American Automobile Association. While there has been an acquiescence for several years on the part of motorists in accepting this tax when the money was employed in highway progress of one kind or another, especially in those states where it was paid in lieu of a personal property tax, the legislatures of the past winter have shown such a marked inclination to increase fees to an exorbitant degree that the A. A. A. officers have taken up the matter with the state divisions of the national body, with the result that presi-

dent Laurens Enos appointed a special committee to prepare and present a report at the meeting to be held in Baltimore, May 8.

William H. Hotchkiss, of New York, is chairman of the committee, with Lewis R. Spears, of Massachusetts, and H. M. Rowe, of Maryland, as his associates. Charles Thaddeus Terry, chairman of the A. A. A. legislative board, who has had much to do with the framing of motor laws in many parts of the country, will assist the committee in the preparation of its report, which is going to be unusually thorough.

Where the registration tax has been in lieu of all other taxes, and the money used exclusively for road maintenance, as in New York state, there has been



Beautiful Macadam Road at Paris, Arkansas

slight objection on the part of the motorists over the unconstitutional discrimination against one class of road user, as long as the amounts paid were within reason. The protest recently has accumulated strength in those states in which the owners of motor-driven vehicles are called upon to pay a registration tax, personal property tax, and still another tax for the driving of the car. Double taxation and discrimination against one class of road user are the two points which invite attack on the ground of unconstitutionality.

The case that may be carried up originated in New Jersey, which state calls for three payments by the automobile owner: registration of car, driving license, and property tax. The New Jersey state organization instituted the suit, which has had adverse decisions in the New Jersey courts.

A Motor Truck on a Mountain Road

By N. BUCKNER

Secretary of the Asheville, (N. C.) Chamber of Commerce

WHILE it is well known that the motor car and motor truck are rapidly displacing the horse on the streets of our southern cities for all purposes, the enterprising city of Asheville, in the mountains of western North Carolina is not only displacing horses by wholesale with motor trucks, there being nearly a hundred motor trucks here, but the time honored mule, the burden bearer of the human race for centuries, is being shoved off the boards by Fred L. Seely, former owner and editor of the Atlanta Georgian, who has charge of the construction work of Grove Park Inn on the slopes of Sunset Mountain at Asheville. Mr. E. W. Grove, the Asheville-St. Louis millionaire is amusing himself building what he has stated is to be "not the largest, but the finest tourist hotel in the world," the construction of which is altogether so unique and different as to compel the attention of all. It is 400 feet long by 80 feet in width, and is built of rough stones gathered up on the mountain sides for several miles around. These stones, or mountain boulders are hauled on drags, sleds and wagons to the exclusive

automobile road, and there loaded on wagons hauled in motor trains of fifteen wagons to the Inn three miles below. The wagons are of the usual two-horse style, of Birdsall manufacture, and to prevent the rear wagons cutting across to the inside of the many sharp curves on this mountain automobile road, Mr. Seely cut off the tongue of the wagons to four feet in length, removed the coupling pole and inserted another that extended four feet to the rear, and applied a coupling device similar to the old link and pin coupler formerly used by the railroads. This projection of the coupling pole four feet to the rear coupled to the four foot tongue of the wagon behind in going around curves guides the front wheels of the wagon following sufficiently toward outside of curve as to track with rear wheels of wagon immediately ahead.

The truck, a three-ton Packard, does the work of fifteen pairs of horses, or mules, and has been in this service for the past five months, the only repairs made in that time being the replacing of two connecting rod bearings, one set of chains, a small sprocket and a new



On "Sunset" Mountain. Motor Truck Drawing Fifteen Wagons Loaded With Stones Picked Up On the Mountain Sides. This is a Part of E. W. Grove's Famous Automobile Road Up "Sunset" Mountain



A Macadam Road Near the City Limits of Asheville, North Carolina. The County of Buncombe, in Which Asheville is Situated, Has a Fine Road System and is Constantly Improving It

set of tire blocks, all of which was after the truck had passed the 5000-mile mark. The truck is on the move regularly from 7 a. m. to 6 p. m. and less than five hours has been lost in day time during this entire period for making the repairs.

The stones picked up from the mountain sides are tied into the outer face of the walls of the inn in beds of cement not visible to the eye. The weight of these stones vary from a few pounds to as much as 600 pounds, the latter being used for lintels and door jambs. No mark of hammer mars the natural face of the stones, and many of them bear the mosses and lichens as they come from their mountain beds. The effect is strikingly rugged and picturesque. Big forces of men are working day and night, and the Inn will be open for the entertainment of guests, July, 1913.

Special furnishings will add to the interior of the Inn. The big room, 80x120 feet, will contain three rugs costing \$5000 each, and will have two immense fire places that take logs 12 feet in length. Four hundred one-piece rugs are being made in Aubusson, France; 700 pieces of furniture for dining and grill rooms and big room are being made by the Roykrofters, 1600 pieces bedroom and hall furniture by the White Manufacturing Co., Mebane, N. C. All hardware for furniture is being hammered from solid copper by the Roykrofters and will be sent to Mebane to be applied; all silver is to be hand hammered. Certified milk and cream will be furnished the guests from 200 registered Jerseys on the estate of Mr. George W. Vanderbilt. These are but a few suggestions of the arrangements which are being made to render this the most comfortable and delightful hotel ever opened to resort guests.

Dickson county, Tennessee, gets in the good roads procession by voting a bond issue of \$250,000 for road building.

Good Roads Activities Around Bristol, Va.-Tenn.

Secretary Lester C. Busch, of the Bristol Board of Trade, writes Southern Good Roads as follows:

Following out the general program of good roads building in this section voters of Greene county adjoining the county in which Bristol is located, have voted \$500,000 in good roads bonds and when the money has been spent in that county, another link in the Bristol to Memphis highway will have been completed.

Three districts of Scott County, Va., voted \$165,000 in good roads bonds this week, and when this money has been spent in that county another link in the Bristol to Lexington, Ky., highway will also be nearing completion as one district is still to vote on the proposition to complete it to the Lee County, Va., line.

The road from Bristol to Abingdon, Va., a distance of about 15 miles is gradually being built and by the end of the summer it is expected that this important link in the Bristol to Washington Highway will be ready for use.

The good roads agitation which has been kept up by the Bristol, Va.-Tenn., Board of Trade during the past two or three years is now beginning to bear fruit, and Bristol in another two years will be the center of the greatest highway system in the entire south.

A sum total of nearly \$6,000,000 has already been appropriated and made available through bond issues for good roads in the various counties near Bristol.

Deep River and Bensalem townships in Moore county, North Carolina, have joined their more progressive sisters in road-building. They have voted bonds for \$20,000 for road-building.

Grover precinct of Cleveland county, North Carolina, has voted bonds for \$10,000 to complete the road from Kings Mountain to the South Carolina line.

The Perfect Country Road---How to Get It

By THOMAS H. KING

Engineering Department of Gulf, Colorado and Sante Fe Railway, Galveston, Texas

I DON'T suppose that I differ from the other engineers or from expert road builders, but my idea of a perfect country road is this: A dirt road of easy grades, well drained, plowed deep, graded and harrowed, and last, but by no means least, thoroughly and heavily rolled. This rolling will make it solid and homogeneous and prevent sink holes.

Then, when it is opened to the public there is a road superior to any pavement or macadamized surface for six reasons. They are: This road is cheaper to build in the first place—the material is 'right there.' It is more easily and cheaply kept in good condition. It is easier on horses' feet. It is pleasanter for light and pleasure travel. It is equal to any road for heavy work as long as it remains good. Wide tires will cause it to remain good.

The people the country over have been very generous to themselves in assuming such a vast amount of bonded indebtedness for the purposes of obtaining good roads.

Naturally the general idea is that the money thus expended will give them roads permanently good. But will it be so? No road, however well built, will take care of itself with the present means of traffic.

Under the antiquated system of care-taking now in vogue the sad experience of generations teaches us that it will be useless to look for any proper care or attention being given them when it is needed.

Neither do I believe the public will stand for the expense of a gang of men on the roads in every township the greater portion of the year, with a big road tax, behind it. How, then, will the roads be kept up? Or will they finally fade away into the same old, rough, muddy condition we have been used to for so many years? The situation confronts us and must be met if the people are to get the full value of their investment.

I wish to suggest a method that will meet the emergency, and if public opinion favors it we can have good roads at all seasons of the year, and the cost of upkeep would be so light as to be almost nominal. We should give attention, not to the roadbed itself, but to the vehicles that travel it, for in that direction we will find the remedy against bad roads.

Take the ordinary farm or lumber wagon, in constant daily use everywhere for hauling loads, heavy and light. It weighs approximately 1,000 pounds, or half a ton. The wagon will convey a ton, and perhaps at times more than that, but as we are dealing only in general terms, say the wagon with a full load will weigh one and a half tons, and it travels on wheels with a tire tread of $2\frac{1}{2}$ inches. When we come to think of the number of these farm wagons, more or less loaded, passing and repassing continually over the public highways, with a tire tread of only $2\frac{1}{2}$ inches, and see their effect upon the surface when the ground is softened from frequent rains, it seems as though better machinery for cutting up and spoiling a roadbed could hardly be devised. While the road is drying out the injury is still going on, and finally leaves the surface rough, full of ruts (and let me say right here that ruts are the worst enemy of rubber tires,) with frequent mudholes to go through or around, until a track more or less smooth is worn down, ready for the operation to be re-

peated at the next rain. This is no suppositious case, but the muddy reality, as we all know, and those of us who have crawled along at the rate of about a mile an hour through liquid mud at one season and over the rough, frozen ruts at another, to our sorrow and vexation, can testify that such traveling is anything but joy riding.

Thus pleasure riding is restricted to a comparatively short time during the year.

Supposing, just for illustration, instead of tires only two and a half inches wide we place under this ton and a half, wheels with a tire tread of nine inches, and, better still, if the fore and hind wheels don't track alike, but overlap three or four inches on each side of the wagon, or, in other words, a pair of rollers each fourteen or fifteen inches wide, that are pressing the roadbed down into a hard, compact and smooth surface. Multiply this effect by all the wagons which could be so equipped that travel over the road, and it is evident that surface must be made and remain firm, hard and smooth at all seasons for all the heavier hauling, instead of cutting it up and making it rough, would be continually rolling it down and making it smooth and even.

The principle is a simple one, merely transforming all vehicles from cutting into rolling machines, by which the vehicles themselves keep the roads in good condition, and do it automatically by just the natural travel of business and pleasure without any outside effort on their part.

In actual practice the width of tires above given would be more than necessary if the wheels did not track alike. Possibly for these farm wagons a six-inch tire with a lap of two or even three inches might be found sufficient for then there would be a pair of rollers each nine or ten inches wide; and were all heavy wagons passing over a road, so provided with six-inch tires and wheels overlapping, the end in view might be accomplished.

However, if the public seriously considered it, the matter would naturally become the subject of thorough tests by authorized experts. Ample width to insure a rolling effect and uniformity of classification of vehicles would perhaps require some legislation to carry out the idea, that each vehicle have tires proportioned to its heaviest load capacity.

Some objections might be raised on the ground that increased tire surface created more friction; but a six or a nine-inch tire rolling on a hard, smooth surface would not cause as much friction and resistance to the haul as a two and a half-inch tire going on rough ground, or on a ground that was soft or muddy.

Make a comparison of the two, the present, and we will call it the future tire. The present wheel, when the ground is soft from recent rains, will, under a load, sink into the surface say three inches, or about the depth of the felloe, which is a very common occurrence; double this three-inch friction for each side of the felloe and add the two and a half inches for the width of the tire, which is crowding down the soil in front of it, and we have the equivalent of an eight and a half inch tire, offering more resistance to the haul than the plain nine-inch tire, which would merely roll on the

surface. While the narrow tire is doing what it can to spoil the road, the wide tire would be doing what it could to preserve it. Again, with wide tires in general use there would be no soft ground.

"Every footpath demonstrates the truth of this hypothesis. The wide soles, under the weight of the bodies of persons passing to and fro, make a firm, compact and smooth surface, good from one year's end to another, and remains so year after year without any care or attention whatever, so long as water does not stand on it, and it is self-evident that the wide tires would have the same effect on the roads if the system became universal, which it is to be hoped it may.

Rains would have but little or no effect on such a roadbed, for the surface being hard and smooth and free from ruts, water would find no lodgment, consequently could not penetrate the ground, but would run off immediately into the side ditches. Dust would not be eliminated, and never will be while the wind blows, and the horses' shoes with their calks hammer on the surface, but it would be much reduced in quantity, for the narrow wheels do their full share toward creating it.

Occasionally places are encountered where the natural soil is too sandy, or a clay too heavy to make a suitable surface, and it is found necessary to put on a top dressing of loam, sand or gravel, as the case may be. Under present conditions it requires not less than from six to twelve inches to prevent the wheels from

cutting through and destroying any good effect it might have. With wide tires, two or three inches, evenly spread, would be ample, and soon pressed down and incorporated with the native material, making a good, permanent surface.

The manufacturers of traction engines understand the situation. They know very well what their heavy machines would do, and what they would not do with narrow wheels, so they place them on wheels with a tire tread of eighteen and twenty inches or more, and the result is a traction engine can go with ease over meadow land, cultivated soil and soft ground anywhere without sinking, and do an enormous amount of work.

History tells of the many battles lost through the failure of an army, or a portion of an army, to reach a certain position in time, on account of the fearful condition of the roads? On how many of these occasions would wide tires on the wheels of their artillery and wagon trains have made for success instead of disaster?

Some expense would be incurred in changing wheels and perhaps in lengthening the axles of the heavy wagons. The clumsy appearance of wide-tired wheels would soon pass out of notice, as heavy rubber tires of autos have done. The greatest obstacle to overcome would be the inertia of custom and dislike for change into new conditions, common to us all, but even that would give way when it was thoroughly demonstrated in a practical manner that the roads could be kept in good condition for use the year around.



THE ROAD EVERLASTING

Fine Type of Brick Roads Found Around Cleveland, Ohio. This is the Warner Road at a Point Where the Grade Reaches 10%. Four Inch Concrete Base With Sand Cushion and Cement Filler and Concrete Curbs and Gutter



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No. 5.

THE OUTLOOK ENCOURAGING.

The year 1913 is going to be a record-breaker in every way and particularly in the matter of building good roads. The Solid South is going for good roads with a vim and great things are being done in every southern state.

Texas counties have voted bond issues aggregating \$4,000,000 since the first of the year and scores of other bond elections are scheduled for this summer and fall.

Louisiana was never so highly interested in the good roads question and parish after parish is falling into line, voting bonds and special taxes, and building splendid shell and sand clay roads.

Florida has startled the nation with a proposition to bond the state for \$50,000,000 to build a system of state roads. This means that Florida has confidence in herself and in her future. The good roads advocates of Florida are putting up a wonderful fight for it and their slogan, "not an expense but an investment," is heard from one end of the state to the other.

The Tennessee legislature quarreled and squabbled throughout the recent session but even the political strife and turmoil was not sufficient to down the good roads spirit. In this issue of the magazine, the road progress of Tennessee is sketched admirably by Mr. C. C. Gilbert.

Georgia, Alabama—and this state claims to be more

active in road-building right now than any other southern state—South Carolina, Virginia, Arkansas, Mississippi—all are doing business right along and building miles and miles of good roads.

Old North Carolina is not lagging behind. Save in Davidson county where the good roads fight received a temporary set-back at the polls last month, the trend has been steadily onward and upward. In Stokes county, three townships have voted bonds for \$105,000. Vance county has voted bonds for \$200,000. Lincoln for \$200,000. Rutherford, \$250,000. Madison, \$300,000. Dozens of townships all over the state have voted bonds for smaller amounts. In the western part of the state alone more than \$1,200,000 in bonds has been provided for road-building and this is only the beginning.

The record made by the south in road-building last year and in 1911, was astounding. It opened the eyes of our brethren of the north and west but those records will not stand with the record of 1913.

Mark the prediction.

NATIONAL HIGHWAYS.

In this number of Southern Good Roads Mr. Charles Henry Davis, president pro tem of the National Highways Association, outlines in a most interesting manner the highway system which his association stands for. He makes it plain that the system proposed is only a tentative one and that his association stands ready to listen to suggestions from every state in the union to the end that the system may be bettered and the greatest good accomplished for the greatest possible number.

Mr. Davis' article will be found worth reading. The story of the formation of the great association of which he is now the acting head is told simply and modestly. He is doing a great work and some of these days the nation will come to realize it.

It should be noted that this map is not one of the ordinary variety. It was not sketched out with pencil and rule on an ordinary outline map of the United States by one man in a few hours work, as has been the case with nearly every map presented by other associations, but it is the result of many years of careful thought and investigation. Every road shown on the map has been carefully and painstakingly located, an existing road being selected or other location adopted on recommendation of a competent highway engineer familiar with local conditions in each case.

Many thousands of personal letters were received and digested in regard to these roads and an immense amount of work was done before the map was finished and ready for publication.

The article is distinctly worth while and we hope that every reader of Southern Good Roads will give it the attention it deserves.

According to reports sent out from Anderson, Grimes county, Texas, has awarded contracts for improving 40 miles of roads at a cost of \$140,000.

National Good Roads Federation

The good roads convention at Birmingham April 22 to 25 brought together nearly 1,000 delegates from all parts of the United States representing cities, counties, states and commercial and civic organizations.

An important action of the convention was the changing of its name from the National Good Roads Federation to the United States Good Roads Association and the adoption of a new constitution. The next meeting of the body will be held in St. Louis, Missouri, in November.

The following officers were elected: President, Senator John H. Bankhead; First Vice President, Col. Dell M. Potter; Treasurer, Judge W. I. Grubb; Secretary, J. A. Rountree; Managing Director, Thomas L. Conway; Second Vice President, E. J. Watson; Third Vice President, John W. O'Neill.

Vice presidents and directors for the various states were elected as follows:

Alabama, Reuben F. Kolb, John Craft, and V. B. Atkins, with Gardner Green, director; Missouri, F. E. Bartlett, John H. Nolan and Thomas Wilson, with T. T. Fauntleroy, director; California, F. W. Jackson, with Eugene de Rackin, director; South Carolina R. S. Whalet, D. M. Crossin, and F. H. Hyatt, with F. H. Colcock, director; New Mexico, S. M. Johnson, John R. French and J. W. Low; Tennessee, W. A. Johnson, W. M. Pollard and Cyrus Kehr, with C. C. Gilbert, director; Kentucky, R. G. Railey, with W. W. Duffield director; Mississippi, E. J. Morrison, H. F. Broyles and B. Thomas, with M. T. Kerr, director; Arizona, L. B. Elliott, N. B. Orme and B. F. Billingsley, with J. J. Keagan, director; Alaska, Mrs. S. R. Bernadri, Fay Delezene and Hugh J. Lee, with Harry Still, director.

Delegates to the International Good Roads Congress that meets in London were chosen as follows: J. H. Cook, G. A. Nelson, James Palmer and Robert Woodson.

Resolutions were adopted as follows:

"Resolved, That this association, voicing the sentiment of the people of the 24 states here represented, urge upon the congress of the United States the enactment immediately, under the federal constitution, of such legislation in behalf of a general system of good roads and highways as in its wisdom best meet the demands of the moment and of the future.

"Resolved, That the president of this body name a special committee of five representative men to visit Washington at the earliest possible moment and present to the committees of the congress and to the administration this expression of the American people.

"Resolved, second, That this association recommends that each state should adopt an adequate state highway department.

"Resolved, third, That this association send delegates to the International Good Roads convention, which convenes in London, England.

"Resolved, fourth, That the president is hereby authorized to appoint a committee of three, of which he shall be one, with plenary powers to negotiate and consummate amalgamations with other associations striving for the same purposes."

There were many fine addresses made and every session was full of interest.

Among the addresses that attracted most attention are noted the following: "Big Paths for Uncle Sam," by Thomas L. Cannon, St. Louis, Mo.; "The Farmers Interest in Good Roads," by Commissioner of Agriculture R. F. Kolb, of Alabama; "Raising Money for Road

Construction," by C. C. Gilbert, of Tennessee; "The Partnership Principle," by Joe L. Long, of Des Moines, Iowa; "Alaska Wagon Roads and Foot Trails," by Mrs. Suzzanna Rognon Bernardi, Nome, Alaska; "What Good Roads Mean to the Nation and Why," by E. J. Watson, Commissioner of Agriculture, of South Carolina; "Federal Aid for Roads," by Congressman D. W. Shackelford of Missouri; "Concrete Roads," by Lewis R. Ferguson, assistant secretary Association of American Portland Cement Manufacturers, Philadelphia, Pa.; "Slag in Highway Construction," by Solon Jacobs, Birmingham, Ala.

Special Congressional Post Roads Committee Proposed.

If congress creates a committee on post roads another important move will have been made towards the logical participation of the National Government in the highways progress of the country. Such action is quite a probable in the special session now in progress in the adoption of a resolution introduced by Representative R. L. Henry of Texas, who is chairman of the committee on rules.

It will be remembered that following the first Federal Aid Good Roads Convention held in Washington, January, 1912, there followed as the result of the action of the nation-wide assemblage the passing in congress, put forward by Representative Henry, of a resolution which created a joint committee of the two branches to make inquiry into the subject of federal aid in the construction of post roads. This committee has not yet concluded its labors, but it is known that it has accumulated a vast amount of information which will be available in reaching a definite plan for federal roads work.

In the Second Federal Aid gathering held in March last, and again participated in by general good roads bodies from all over the country, and including the National Grange executive chairman, the resolutions committee asked congress to create a standing roads committee, the matter having been advocated in an address prepared by Representative C. B. Slemm of Virginia. Once more Representative Henry has taken the initiative in his introduction of a resolution providing that the house create a committee on post roads, which would have the same relation to the good roads proposition as the rivers and harbors committee has to waterways legislation.

In the past, good roads measures have been referred to various committees, with the usual result of secondary consideration in the miscellaneous work of these committees. The subject is now one of such commanding interest that it demanded a committee which will give it first attention. In the growing consideration of good roads matters by congress there is an unmistakable advance in the contention that the national government should concern itself along broad lines relating to the inter-state phase rather than any plan which would require the nation to do work very properly devolving upon the community. President Wilson aptly expressed the logical thought when at the American Road Congress he described roads progress as "threading the energies of a nation together" and then commented upon the "fundamental importance that the United States should think in big pieces, should think ultimately as a whole."

The principal arteries of communication, and the ones properly first attracting federal notice, develop

themselves naturally, and in this connection a study of the map of the United States shows that a great majority of the large cities of the country are located near the borders of their states. It is fair to presume that in each such case, nearly as much traffic will reach a city from the adjoining state as from its own. In marketing products, sending out supplies, and transporting individuals state lines fail to serve any beneficial purpose. The travel, whether commercial or pleasure, is either created or attracted by the larger center of population, which is at once the commercial,

social, educational, and industrial center of its region.

What is true of the greater cities is true of the lesser ones, the difference only being in degree. As these lesser cities are usually located on the main lines of travel, they are, in themselves, centers of traffic of their respective regions. It is the traffic between these lesser cities and that between them and points adjacent, which uses the main road for a part of its journey that forms the major factor in the usefulness of a main highway. The long distance trip is also a factor, but a minor one in importance.

Review of Recent Good Roads Activities in Virginia

The Times-Dispatch, the leading daily newspaper of Virginia, is a day-in-day-out consistent good roads advocate. In a recent issue the progress of good roads building in Virginia is reviewed in a very interesting manner. The Times-Dispatch shows that approximately \$7,500,000 has been spent in Virginia in the construction of permanent roads during the last four years, under the direction of the state highway commission, whose annual report is now in the hands of the printer. The exact amount would be difficult to ascertain, since in many instances the convict camps collide with state money aid and also with county appropriations.

The thing has been cumulative. One after another the counties and cities have gotten into line and made special appropriations and issued bonds for permanent improvements to the public highways. In many cases projected bond issues, first defeated, have been later approved by the voters, indicating the growth of sentiment.

Among the counties that have been most active in taking advantage of state aid to good roads and in going into their own pockets for large appropriations is Mecklenburg. The map issued by Commissioner Wilson, to be part of his report, shows a perfect network of the red lines that indicate road building. Radiating from Boydton, from Chase City, from South Hill and from Clarksville, roads go in all directions, most of them connecting these prosperous towns in that progressive county.

Culpeper and Orange show extensive road work, and the lines in the map indicate a definite purpose of reaching traveled routes and of having connected roads. The northern part of Spottsylvania county is thick with red lines. Henrico has a very respectable share, indeed, in this marking, as have Dinwiddie, Nansemond, Brunswick, Nottoway, Augusta and Halifax.

But it is the Southwest that leads all the rest in the matter of road building. Wise county is first in the state, having voted more than \$1,000,000 in bonds for permanent highways, all of which is not yet expended.

The county is now covered by a system of roads that will be there always, affording travel in all directions. The cost of construction there is very great, for the county is nearly all mountains, and grading is a tremendous item. Besides, the proportion of farming land is not large. But the mine owners, who pay the bulk of the taxes, have not hesitated to indorse the bond issues and to stand for the taxation necessary to provide interest and redemption funds.

Tazewell, also in the southwest, comes next, with a bond issue of \$625,000. This was not accomplished without a good deal of strife, accompanied by the usual argument of "paying as you go," but opposition is

said to be now nearly a thing of the past. With the single exception of Mecklenburg, Tazewell shows more completed and prospective roads than any other county in the state.

With the building of all the roads authorized in the southwest, it will be possible to travel over modern highways from Bluefield, W. Va., on the state line, through Tazewell, Russell, Wise and Lee Counties, to the Tennessee and Kentucky borders, with but one or two small gaps. Or, with a road projected from Abingdon through a gap of the mountains into Russell county, a trip may be made from Bristol to Bluefield.

As far as the Southwest is concerned, the Bristol-to-Washington highway is almost a fact. A continuous line carries a road through Washington county and most of Smyth. Wythe county is doing its part to a point near Pulaski county, through which the chain is almost complete. Montgomery is likely to be the stumbling block, for that county has apparently not caught the good roads fever. Nor has Buchanan, which is mostly mountain. Scott and Giles have used up their part of the state aid in building bridges.

Counties authorizing bond issues up to September 30, 1912, are as follows, there having been several additions since, including Wise:

Accomac (Atlantic District), \$50,000; Amherst, \$80,000; Amherst (second issue), \$135,000; Augusta (one district), \$250,000; Brunswick (two districts), \$84,000; Charlotte, \$100,000; Culpeper (one district), \$45,000; Culpeper (one additional district), \$120,000; Dickenson (one district), \$54,000; Dinwiddie, \$102,000; Fauquier (one district), \$75,000; Greenville, \$82,000; Lee (four districts), \$364,000; Lunenburg (Brown's Store District), \$40,000; Mecklenburg (seven districts), \$350,000; Norfolk, \$200,000; Northampton (one district), \$50,000; Orange (one district), \$50,000; Orange (two additional districts), \$125,000; Pittsylvania (one district), \$100,000; Pulaski (one district), \$70,000; Pulaski (Dublin District), \$100,000; Rappahannock (one district), \$30,000; Rockingham (one district), \$30,000; Russell, \$150,000; Russell (second issue), \$275,000; Smyth (one district), \$100,000; Spottsylvania (two districts), \$100,000; Stafford, \$100,000; Tazewell, \$625,000; Warren (one district), \$30,000; Washington, \$200,000; Wise (first issue) \$600,000. Total, \$4,966,000.

The commissioners of St. John county, Florida, are planning to pave portions of the John Anderson Boulevard from the Duval county line to the Volusia county line. Of this, eight miles will be paved with vitrified brick and the remainder with shell and macadam.

The Lovingson Magisterial District of Nelson county, Virginia, has voted bonds for \$35,000 to build ten miles of macadam road.

Road-Building, Road-Boosting and Road-Boosters Throughout the Nation

Reviewing progress in road-building throughout the state in anticipation of the good roads convention at Birmingham on the 24th of last month, the Montgomery Journal said that Alabama would be ready with a splendid report of road progress and made the statement that it is doubtful if there is another state in the union so actively interested and engaged in road building as is Alabama.

"The state engineer is now at work with a force of men and teams on the Florence and Waynesboro pike out at Petersville, about four or five miles out from Florence," says the Florence Times. "This pike is sure to go and will enhance values and make improvements every foot of the way. Keep your eyes on this pike and work for pikes in all parts of the country."

"The new seventeen thousand dollar pike recently built by the county, for the lack of attention, is going to soon be in such bad condition that it will take several thousand dollars to repair the damage," says the Centreville Press.

"If we had a common trade center in our county the solution of the road problem would be much easier," says the Oneonta Democrat. "As it is the plan to divide the money squally between the four districts will help all alike. Lay down prejudice and vote your judgment this one time for a change. If you do the good roads are assured."

* * *

"Motorists in the South American republics are going after good roads with a zeal that promises to make their highways among the finest in the world," says H. E. Fletcher, United States minister to Chile.

"As a rule the highways in Chile have excellent natural foundations, in many localities the roadbeds being of solid rock. Until the advent of the motor car there, however, little attention was paid toward the upkeep of the roads and frequently they were so littered with small boulders and sand as to make travel by automobile an expensive, unpleasant and somewhat hazardous undertaking.

"Now the motor enthusiasts are organizing and are pushing the good roads movement with great results. In Santiago, Chile, the members of the American colony are active in the work of improvement."

* * *

Advocating better roadways throughout Bexar County, Congressman James L. Slayden delivered an interesting talk last month before members of the Bexar county, Texas, Farmers' Institute in the Chamber of Commerce auditorium at San Antonio.

Congressman Slayden stated that no matter if the cost of maintaining the highways amounted to 10 or 15 per cent annually, the farmers should be willing to pay it, as good roads is one of the best investments open to people living in the country. He said, however, that he did not believe in paying an exorbitant sum for improving the roadways, when the work might be done by as accomplished men for less money.

"The roads are for the farmers who use them daily," said Congressman Slayden, "and not so much for the city people, who travel over them occasionally."

Congressman Slayden said he did not believe in heavy taxation and thought the farmers were now pay-

ing a sufficient amount of taxes on the roads in Bexar county. He referred to the good roads campaign which is being waged throughout the north, east and west, and said that Bexar county has a larger mileage of good roads than the entire state of Mississippi.

John C. Beck acted as chairman of the meeting and before introducing Congressman Slayden made a short talk. He stated the county should keep up improvements on the roads that have already been built, instead of extending new highways, and told of the work accomplished during recent months.

It was expected that George D. Marshall, government road supervisor for this district, would address the farmers, but he was called away from the city and was unable to be present at the meeting.

The meeting was largely attended, and, following the regular programme, there was an open discussion on good roads.

* * *

Trust the Breeders' Gazette to hand out chunks of wisdom every time. No matter what subject this enterprising journal discusses, it rings the bell almost every shot. The following is a sample:

"There are two forces at work on our highways: one seeks to improve them; the other consciously or unconsciously is destroying them. To the man who has dragged a road and rounded it up nicely but has not made it quite firm and hard all over, it is maddening to see his neighbors deliberately or carelessly plowing through with loaded wagons, making no effort to avoid the ruts and constantly digging them out again and undoing practically all that has been done. Why is this not a good test of citizenship: that a man take care not to drive in ruts; that he try to leave the road better for his having traveled over it? It is especially to be deplored that men should follow ruts in new hard roads when all the surface is equally good."

* * *

At no time in the last two years have the roads between Los Angeles and a San Diego been in better condition than now. This is the report given out by the touring information bureau of the Automobile Club of Southern California.

"Of course there are some rough spots here and there on both inland and coast routes," said O. K. Parker, chief of that bureau, "but in general we can recommend parties to a pleasant trip San Diego way.

"In no other part of Southern California is there more luxuriant vegetation, more beautiful wild flowers, finer pine timber or better mountain and valley roads to motor over than in the San Diego so-called 'back country.'"

* * *

The first occasion on which a state legislature was publicly and unanimously complimented for any special act it had accomplished is said to have occurred last month when the Denver Motor club entertained the Nineteenth General assembly and state and city officials at a luncheon at the Albany hotel.

The good roads bill, which will provide approximately \$1,000,000 for road-building purposes during the biennial period, was the particular subject for felicitation. Richard Broad of Golden, who was one of the speakers

said he believed the first work that ought to be done is that of building roads to and through the Mountain park which Denver will build in the foothills immediately west of that city.

* * *

In addressing a gathering of motor enthusiasts at Denver, Colorado, recently, Mr. Charles F. Tew, of Greeley, Colorado, made this statement:

"In the days when part of a man's occupation consisted of tanning fig leaves to make Parisian gowns for the suffragette portion of the family, they knew enough to build roads. I would rather be the builder of a road to a cottage, where children play under a purple, sunkissed grape arbor, than to be the inventor or builder of the world's greatest battleship."

* * *

Mr. King Stillman, a prominent farmer of Webster county, Georgia, was interviewed recently by a representative of the Americus Recorder. He told the newspaper man that his county, Webster, is going to try to have as good roads as Sumter county. Said Mr. Stillman:

"Webster has caught the good roads spirit all right, and while our mileage will not be as great as Sumter's, the roads will be all right."

Mr. Stillman stated that already the county forces in Webster had made a good road from Preston, the county site, to Plains, a distance of ten miles, connecting there with the Plains-Americus highway. This new road, he stated, is in good condition.

Webster, like all other southwest Georgia counties, is waking up to the importance of improved public roads and that just completed to Plains will be extended westward from Preston to Richland, in Stewart county. A north and south road, the latter leading to Dawson, will also be built.

"We were little slow getting started," continued Mr. Stillman, "but Webster will in due time have good roads. Ours is a small county, but progressive."

* * *

It may be cheaper to make good roads than to pay damages hereafter.

In the United States district court for Wisconsin John Bloki, a member of the Chicago automobile club, who brought the case, got damages of \$2,500 against the town of Spring Prairies, Wis., for a broken arm and other injuries sustained by him when a motor car in which he was riding turned turtle because one side of the road gave way.

* * *

Mr. J. D. Clarkson, of Carthage, Missouri, president of the famous "365-Day Road Club" of that city, is a great booster and he never lets pass an opportunity of putting in a word for good roads. On the back on his card appear these mottoes: "Many Bad Bonds are only good road material wrongly placed;" "Under our present system, the big fat dollar that goes into the collector's office in the fall looks like 'thirty cents' when you meet it on the road in the spring."

Much wisdom in those two little sentences.

* * *

Mr. O. K. Parker, highway engineer for the Automobile Association of Southern California and assistant engineer for the Santa Fe, Grand Canon and Needles National Highway, was one of the principal speakers at a good roads meeting held last month under the auspices of the Daughters of the American Revolution at Kansas City, Missouri. Mr. Parker came out for the system of national highways advocated by the National

Highways Association, which will connect every city of 20,000 population, or over, and will cost in the neighborhood of \$280,000,000. Concerning his own pet highway project Mr. Parker said:

"The Santa Fe, Grand Canon and Needles National Highway follows closely the route of the Santa Fe railway from Los Angeles to Santa Fe, the route being approximately that of the Kearney trail. It will form the western link of the Old Trails National Highway. There is a good road most of the way and by the middle of the summer it will be posted with signs. The posting of the Santa Fe trail will have been completed by that time, so there will be a well marked highway from Kansas City to the coast."

* * *

Engineer William Dunlap, of Bristol, Virginia-Tennessee, has been given all of the data for the map to be issued by the Bristol Board of Trade, showing all of the highways out of Bristol, including those already built and those projected. The Board of Trade has been busy for several weeks collecting the information necessary and Secretary Lester C. Busch has placed it in the hands of Engineer Dunlap.

The map will show the proposed Memphis-to-Bristol highway, the Bristol-to-Mountain City highway, the Bristol-to-Kingsport highway, the Bristol-to-Washington highway, the Bristol-to-Bluefield highway, the Bristol-to-Lexington highway and the Bristol-to-Wise county highway, besides the other roads that have been built out of Bristol and are now being built, including the Bristol-to-Abingdon road.

Arrangements are being made to make a survey of the Washington county (Virginia) section of the proposed Bristol-to-Wise county highway, a movement for which was launched recently at a mass meeting of road enthusiasts of Bristol, Washington, Wise and Russell counties.

* * *

Of the states which spent more than \$1,000,000 in road improvement in 1912 are noted the following:

Illinois	\$ 7,300,000
Iowa	7,000,000
New York	14,915,141
Washington	5,000,000
Kansas	4,975,000
Pennsylvania	4,000,000
Mississippi	3,500,000
Missouri	3,000,000
Colorado	1,900,000
North Carolina	1,569,000
Connecticut	1,300,000
Ohio	1,122,000

This is only a partial list. Practically every southern state spent more than a million dollars in road building in 1912.

* * *

In regard to the serious question of finding out the type of construction necessary for any given section of road, the Engineering News in a recent issue says

"Without knowing the wear a road has, there is absolutely no way of telling whether it is good or bad; only a careful traffic census can determine this. Roads too costly have been constructed in some places; in other places roads unsuited to the traffic have been built. In view of this well-known fact, it is evident that a traffic census is an essential to economy in nearly all road building. Imagine a bridge designer making plans for a structure without anything more than a rough guess whether it was to be used by steam rail-

ways or trolley cars, and we have an idea of the absurdity of proceeding with road building without traffic data."

* * *

"Roads that go somewhere," is an expression which is being heard incessantly in connection with the country-wide attention to the improvement of the highways. Judge J. M. Lowe, president of the Old National Trails Ocean-to-Ocean Road, tersely summed up the matter in these words:

"A road extending across a township of course has value; it has increased value when it goes across a county; it has considerable increased value when it extends across a state; but it is of infinitely more value when it extends from state to state, across the continent."

* * *

In a speech before the Women's Civic League of St. Paul, Minnesota, recently, Hon. George W. Cooley, of the State Highway Commission of Minnesota, had this to say about the relation between good roads and the high cost of living:

"The 450,000 people of St. Paul and Minneapolis consume daily 500 tons of vegetables, produce and meats brought from farms in this vicinity. It costs now 25 cents per ton per mile for transportation in the United States. If our roads coming to these two cities were what they should be, the cost of transportation on supplies for Twin Cities people would be so much reduced that we could build 500 miles of first-class roads every year in this state with the amount saved. The average distance to market for each farmer is twelve miles and the average load weighs one ton. Good roads mean much in the reduction of the cost of transportation, and this means material reduction in the cost of production. It is economy for the state to have good roads."

* * *

A campaign has been started by the Colorado Good Roads association to advertise the state's good roads and scenic attractions to automobile owners in the east.

W. H. Emmons has just completed the first press bulletin which states:

"Particular attention will be paid to those roads leading into the state from Kansas, Nebraska, Oklahoma and states on the east. The roads leading across the mountains will be improved, and it is expected that the automobile visitors to Colorado will this year find better roads than ever before."

Plans are now being made to issue a second edition of the book entitled "Highways of Colorado." This book will contain official logs of the various routes in Colorado and other useful information for tourists. It will be distributed for the purpose of attracting tourists to Colorado.

* * *

The Michigan legislature passed the Newall Smith automobile tax bill on April 23rd.

The bill provides for a graded tax on automobiles and auto trucks based on their horsepower, and the money thus raised is to be devoted to good roads. The bill had a stormy time in the house and Representative Smith was kept busy preserving its important provisions. In the senate not much opposition developed.

* * *

Merchants will always find that it pays to build roads from their towns out into every section of the surrounding country and connecting at the county lines with other roads. This is what the Americus Record-

er, published at Americus, in the famous good roads county of Sumter, Georgia, says about it:

The large number of out-of-town shoppers who visit Americus every day, the greater number of whom come by automobile, attests the appreciation of good roads, such as Sumter and many of the neighboring counties now have. Good roads are trade-winners in themselves, and when one can make the trip here so easily in a machine, it is not at all strange that Americus should get this trade.

There is seldom a day that shopping parties are not here from either Plains, Ellaville, Leslie, DeSoto, Andersonville, Dawson, Smithville, Oglethorpe and other towns within a radius of twenty or thirty miles. Good roads lead to Americus from all of the towns mentioned and others besides and it is an easy matter to speed here in an hour from any town in this territory.

* * *

Thompson C. Campbell, a leading theatrical man of the south, who lives in New Orleans, is a good roads booster. He has been in the business for many years and is credited by the New Orleans States with being the man who hitched the first horse to the good roads band wagon, long before the good roads movement took firm root in Louisiana.

"My motto when it comes to boosting business development for New Orleans is 'a good road leading to the factory,'" said Col. Campbell.

"If New Orleans had good roads diverging north and westward into the fertile fields of the agricultural belt that lies suburban to its parish lines its supremacy as a manufacturing city would soon assert itself. Plan out in your mind's eye a vision of a great public highway penetrating the agricultural El Dorado of upper Louisiana, and through the rich plantations of the lower state, and you can dream quite naturally of a line of auto trucks and teams bringing to its natural manufacturing base the products of what we all agree is the greatest agricultural state of the continent.

"To the mind of the man who looks on from a student's point of view it seems like economic folly that the raw products of Louisiana's lands should go a thousand miles over railroad rails to the mills of New England and of the West, and then come back to us manufactured into salable merchandise—plus the railroad freight rates incurred en route."

* * *

For the purpose of calling national attention to the many scenic beauties of Idaho a determined effort will be made by the publicity bureau of the coming Intermountain Good Roads association convention, which occurs in Boise City, Idaho, on the three days beginning June 10, to organize auto tours from the various intermountain states within the association to Boise. The co-operation of the various automobile associations of the states of Montana, Wyoming, Utah, Colorado, Nevada and Idaho has been enlisted and from reports received from the several states it is highly probable that hundreds of the delegates to the convention will journey to Boise by auto.

The hustling town of Gastonia, North Carolina, is to have built 38,000 square yards of concrete sidewalks.

Dinwiddie county, Virginia, will gravel the Jerusalem plank road from the city limits of Petersburg to the Prince George county line.

The town of Wilson, North Carolina, will vote on the 15th of this month on \$80,000 of bonds for street improvements.

GOOD ROADS NOTES

GATHERED HERE *and* THERE

Alabama.

At the regular quarterly meeting of the Alabama State Highway Commission held at the capitol in Montgomery last month, the work of the commission for the past year was reviewed and plans laid for the future.

W. S. Keller, State Highway Engineer, submitted a statement showing the number of miles of roads constructed during the last three months, the cost of the work, the number of new bridges erected and the amount of work now in progress on the roads. Mr. Keller also offered a complete summary showing the total work of the department since it was first created. A list of the counties that have filed applications for state aid funds was also presented before the commission.

Members of the State Highway Commission are: R. E. Spragins, Huntsville, Chairman; John Craft, Mobile; V. B. Atkins, Selma; Dr. E. A. Smith, Tuscaloosa, Prof. N. G. Mitcham, Auburn, and W. S. Keller, State Highway Engineer.

* * *

Arkansas.

A news dispatch from Paragould, Arkansas, in Greene county, says that good roads enthusiasts of that section have launched a movement to raise \$20,000 for the construction of a model highway across Greene county from the Clay to the Craighead county line. At a recent meeting \$5,000 was subscribed and soliciting committees are at work in the country securing subscriptions.

It is stated that the route of the national automobile road from Duluth, Minn., to Hot Springs, has been changed from the east side of the Mississippi river to the west side, from Cape Girardeau and that the route now runs through Clay, Greene, Craighead, Poinsett, Cross and St. Francis counties to Forrest City and from there to Hot Springs.

Citizens of Clay county are co-operating with the Greene county enthusiasts in building a road from the Missouri line extending through the two counties to the Craighead line. This will be used as the national automobile highway. It is reported the county judge of Poinsett county has already condemned the land for the road through that county. Many Paragould citizens believe the building of this road through the county, becoming, as it will, a section of the national highway, will prove more profitable than a railroad.

The new Arkansas State Highway Commission, recently created by the legislature, should be able to do much toward helping along the project of constructing the highway referred to. The law creating the commission provides that "the department shall furnish uniform plans and specifications for the improvement of roads, highways and so forth by contract or otherwise, and, when requested by the proper authorities, and when the proposed improvement is of sufficient importance, it shall send a properly qualified expert to plan or supervise the same." The law also provides that "the department shall aid and advise in the formation and management of road and other improvement districts throughout the state and it may detail such officers and employes for the promotion and or-

ganization of such districts as it may see fit, as well as for the introduction of improved methods or system of any kind in road building and public improvements."

Commenting on the work being done in various sections of the state and the relation of the commission to it, the Little Rock Gazette calls attention to the importance of selecting a state highway engineer of ability, declaring that the success of the department depends largely on the state highway engineer. The Gazette says:

"The act creating the State Highway Commission provides that the 'state highway engineer shall be a graduate of some reputable school of engineering and shall be skilled in surveying and road building.' But there are thousands of graduates of reputable schools of engineering who would not be the right men to fill the position of highway engineer of a state. And any engineer who had done any road building could be called skilled in surveying and road building."

"Whether we are to have for state highway engineer a highway expert, not merely a civil engineer who may have built a few miles of road, but an engineer who has devoted himself for years to highway building just as another engineer may have devoted himself to street paving and another to sewers or another to building dams in rivers—whether we are to have in the real and true sense a trained, experienced and skilled highway engineer as the road authority of the state of Arkansas depends on the three members of the State Highway Commission."

The Gazette advises the commission to get in touch with the United States Office of Public Roads and other authorities before making a selection and be sure of getting the right man.

* * *

Colorado.

Southern Good Roads has referred frequently to Colorado, the state in which the convict system of road-building and maintenance has reached its highest perfection, but it is well to keep that progressive state always in mind.

According to the report of the warden of the state penitentiary 157 miles of roadway have been built in Colorado during the last biennial period at an estimated saving to the counties of \$223,479.56.

The convicts have been employed largely upon the mountain and more difficult roads, and the model highways they have constructed have stimulated road improvement and development in every section of the state and have given Colorado a nation-wide reputation for its increasing good roads.

Two of the mountain roads which have attracted widespread attention are the state highway between Colorado Springs and Canon City and the Lincoln highway through Ute Pass west from Colorado Springs. Colorado City and Manitou.

Warden T. J. Tynan states in his report that the average cost to the different counties of this road work has been 32 cents per day per man, making a total cost of \$36,725.44. Adding \$10,080, the cost for feed for teams, the total labor cost to the counties was \$46,905.44 or the average cost of \$298.12 per mile. He pointed out the difficulty of estimating the immense

cost of the roads because of the great amount of blasting and other heavy work necessary on the mountain roads.

Figuring on 132 men working 610 days at \$2 per day; 20 masons and cement workers at \$5, and 5 blacksmiths at \$4 per day, and 21 teams at \$2.50 per day, the warden estimates the value of the labor to the counties at \$266,285, to which he adds \$4,000 for depreciation and interest on state equipment. He said "This labor did not compete with the free labor of the state for the reason that the counties could not otherwise have afforded to do this work."

Colorado has been one of the pioneer states in the adoption of the convict labor plan on its highways and its methods have been copied in other commonwealths.

* * *

Iowa.

The new Iowa highway commission as formed under the Brockway law and composed of Anson Marston, Dean of the engineering school at Ames, James W. Holden of Scranton and H. C. Beard of Mount Ayr, held their organization session in the offices of the commission at Ames, Iowa, last month, noon. Dean Marston was elected chairman.

The commission voted to retain Chief Engineer Thomas H. MacDonald and his staff of assistants temporarily and probably no changes will be made.

The commissioners called on Attorney General Cossom for an interpretation of the new highway law and plan immediately to begin work under it.

* * *

Illinois.

The pages of the musty old records of Illinois in the pioneer days reveal the fact that the first road movement began in 1835, when the Indian trail leading from the direction of Chicago to Elgin was widened. The only roads at that time were the trails that wound through the underbrush, and one of the main highways at that time was the Fox river. Then a few years later the stage coach route to Galena, a more important settlement than Chicago, was established. One of the early customs of the settlers was to hold picnics near bad spots in the road, and a special feature of the entertainment on the occasion, a corduroy bridge over a slough in the road would be built. The first work done by a board of county commissioners regarding the laying out of roads was in July, 1836, when several views of roads were ordered to be made. The necessity of good roads was early recognized, and while there has been a vast stride in road building since those days of Indian trails and precarious stage routes, there still remains much for Illinois to accomplish before the system of permanent highways within her borders becomes an established fact.

Leaders of the good roads movement in Illinois report amazing success in their efforts to line up the different forces in the state behind a single plan, so that when the legislature votes on the good roads measure it may follow a platform that has the endorsement of public sentiment. More than sixty aggressive organizations, some state-wide in their scope and others of local influence, have endorsed the platform for road improvement which was drawn up at the state convention held at Peoria in September, under the auspices of the Illinois Highway Improvement association.

Among the latest organizations to endorse this platform is the Illinois Farmers' institute, which voted its approval at the annual state convention held at Sterling, Ill. Another agricultural organization to endorse the platform is the Cook County Truck Gardeners and

Farmers' association, composed of 2,500 farmers in the country towns outside of Chicago.

* * *

Indiana.

The good roads movement received a great boost in Indiana through the action of the state legislature in providing that all license fees for automobiles and motorcycles shall be distributed in the counties of the state for the specific purpose of improving roads.

The law, in effect, places a premium on good roads and offers each county a practical inducement for activity in road improvement by providing that portions of the fees received by the state are to be distributed among the counties for the purpose of building more good roads.

Thus, the more good roads any county builds, the more road money is distributed to that county.

Motorcyclists were active in obtaining the passage of this law, among them being O. F. M. McLain, president of the Indiana district of the federation of American Motorcyclists. The law does away with all license fees except one to the state, thus reducing the total license cost. Previously it has been \$2 to the state and \$1 to the city. Hereafter it will be \$2 to the state alone. This fee relates only to motorcycles. The license fees for automobiles range from \$5 to \$20 depending on the horse power of the automobile.

All such fees received by the state will be distributed as follows: One-third to be divided equally among counties of the state. One-third to be divided among the counties in the proportion that the number of miles of free gravel and macadam roads in the county bear to the entire mileage of the state. One-third to be divided among counties on the basis of the amount received from the counties for license registration.

* * *

Louisiana.

Concerning the roads of Caddo parish, Mr. J. T. Bullen, parish highway engineer, writes as follows:

"Caddo parish, with Shreveport as the parish seat, has undertaken a comprehensive road system. At present we are working on five main roads, which radiate from Shreveport and will be completed to the parish lines. Beginning last spring, five-mile contracts on each of these five roads were let, and the work is now nearing completion. Last Thursday a contract was awarded to the Healy Construction Co. of Meridian, Miss., for 9½ miles, and to the Louisiana Petrolithic Construction Co. for 5 miles. Another six-mile contract will be let in about 30 days, and a five-mile contract was let to Abney & Pierce about six weeks ago—in all 26 miles for this year. The roads are surfaced with gravel or macadam, and cost between \$5000 and \$8000 per mile. The money is raised by a direct tax of five mills, and the parish will vote this summer on a proposition for extending that tax from 1917, its present date, to 1922. If carried, some means for anticipating the tax will be devised and about \$1,500,000 worth of roads will be built in the next few years. The assessment now amounts to about \$25,000,000, and it is increasing rapidly, as Shreveport and vicinity are growing rapidly."

* * *

Michigan.

By unanimous vote the Allswede bill providing for a system of trunk line highways was passed by the Michigan senate last month. The bill calls for roads up the east and west sides of the state, down through the middle and crossing the state every now and then. The bill carries an appropriation of \$50,000 to cover

the cost of the survey and proposes that the cost of constructing the road be taken from a fund to be established by a proposed tax on motor vehicles. Senator Odell induced the senate to amend the bill to require the construction of a road across the state from Ludington to Saginaw.

North Carolina.

At the recent session of the legislature of the state of North Carolina, the republican leader in the house introduced and secured the passage in both branches of the legislature, the following resolution:

"Whereas, The question of good roads has engaged the attention of the state with great anxiety, and believing that the solution can best be reached by national aid,

"And, whereas, all good roads will tend to stop the tide that flows yearly from the country to the cities by making farm life more attractive and contented,

"And, whereas, this republic must depend in a great measure for its future greatness upon the intelligent and home-loving people who reside mainly in rural districts, not receiving direct benefit of the money appropriated from the United States treasury;

"And, whereas, the result of road improvement wherever and whenever tried has been to increase the value of farm lands and encourage home seekers:

"And, whereas, no people are more loyal, more patriotic, more law-abiding, wealth producing than the toiling millions engaged in agriculture;

"And, whereas, the government has established free delivery mail service and the parcels post, and no legislation is nearer the hearts of the people, and to carry the benefit of this wise legislation with effectiveness into the rural districts, it is needed that the general government should aid in constructing post-roads and highways,

"And, whereas, to raise a sufficient amount of money to build roads and highways without the aid of government would require exorbitant rate of taxation upon the states;

"Therefore, be it resolved by the House of Representatives of North Carolina, the senate concurring, that our representatives and senators in congress be, and they are hereby requested to support and if possible secure the passage of a law, in congress appropriating funds from the national treasury of the United States to aid the several states in road building."

Though championed by the leader of the minority, the resolution met with favor in both houses and was passed with but little opposition. In 1909 a similar resolution, introduced by one of the most popular members of the legislature, a leader of the majority was killed in the senate by a vote of about 20 to 1. Sentiment for federal aid is growing in North Carolina at a rapid rate.

* * *

Ohio.

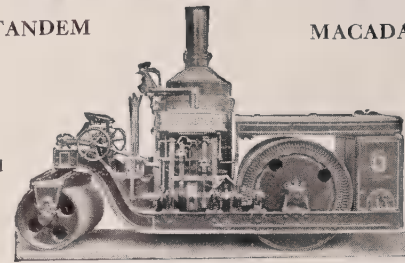
The Hite roads bill, carrying a half-mill levy for construction of market and inter-county roads, was passed by the Ohio senate. As the senate cut out the house amendment changing the course of Route No. 8 between Marion and Sandusky, the bill was sent back to the house for concurrence. The Conover amendment giving counties their share of the state tax, though they do not contribute an equal amount, was defeated. Twenty senators voted for and six voted against this bill, which it is estimated will raise \$3,240,000 for better roads.

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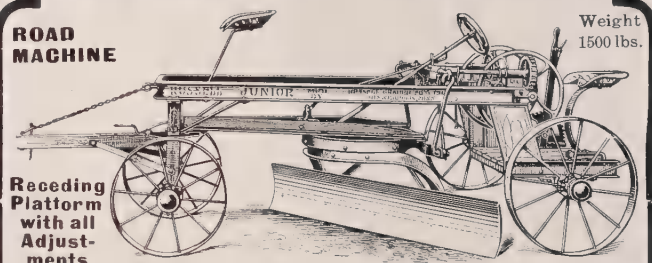
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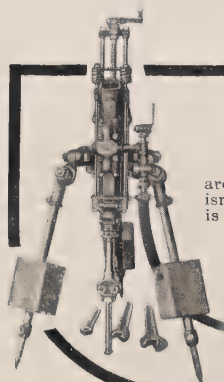
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GOOD ROADS NOTES IN BRIEF

Brazoria county, Texas, has voted bonds for \$300,000 for additional road building.

Panola county, Mississippi, will offer bonds for \$50,000 for improving roads and building bridges.

It is reported that Charles City county, Virginia, will issue bonds for \$50,000 for road-building.

Bradley county, Tennessee, has authorized a bond issue of \$25,000 for road work.

Pike county, Mississippi, has voted \$200,000 for building a system of roads in one district which embraces 115 miles of roads.

Madison county, North Carolina, has issued \$300,000 on bonds for road-building.

Midland county, Texas, has voted bonds for \$50,000 for road work.

Morehead City and Newport townships of Carteret county, North Carolina, will issue \$33,000 of bonds for road work.

LaFayette county, Mississippi, took an upward step by the reason of Beat No. 1 voting road bonds for \$50,000.

Rutherford county, North Carolina, has voted bonds for \$250,000 for road building.

The city of Baton Rouge, Louisiana, votes on the 27th of this month on a paving bond issue of \$90,000.

On June 3rd, Nason county Florida will vote on a bond issue to start road improvements.

Polk county, Tennessee, votes this month on a \$25,000 bond issue of \$180,000 for roadbuilding.

La Fayette county, Mississippi, is asking for bids on the construction of 41 miles of good roads.

Henry county, Alabama, is asking for bids for the building of nine miles of good roads.

Woodruff county, Arkansas, has contracted for grading 32 miles of roads.

The town of Opelousas, Louisiana, will pave eight miles of street and lay a great deal of sidewalk.

Palatka, Florida, will build 3 miles of concrete sidewalks.

Lafourche parish, Louisiana, will build 45 miles of up-to-date highway.

Baltimore has contracted for bituminous concrete paving to the amount of \$47,000.

The State Road Commission of Maryland, has contracted for 28 miles of macadam road recently.

Marshall county, Alabama, has let contracts for 17 miles of roads at a cost of \$42,000.

Bryan, Texas, has issued bonds for \$35,000 to build a system of streets.

Greenwood township, Moore county, North Carolina, has voted to issue bonds for \$10,000 for road-building.

Cameron precinct of Milam county, Texas, has voted bonds for \$150,000 for roads.

Jefferson county, Tennessee, will issue \$125,000 of road bonds.

Four townships in Surry county North Carolina, have voted bonds for \$95,000 for roadbuilding.

The town of Henderson, North Carolina, has voted \$100,000 of bonds for street improvements.

Mt. Airy township, in Surry county, North Carolina, has voted \$80,000 of bonds and will build 45 miles of good sand clay roads.

The legislature of Arkansas passed an act authorizing the construction of a macadam highway from Little Rock, Arkansas, to Memphis, Tennessee, passing

through Pulaski, Lonoke, Monroe and St. Francis counties, on condition that Pulaski county will contribute toward the construction of the road \$75,000 to be ratified by an election. This road is to form a link in the Southern National Highway.

Number Seven township, Cleveland county, North Carolina, has voted bonds for \$50,000 for roads.

Tallahassee, Florida, has voted \$32,000 for additional street paving.

The town of Wilson, North Carolina, has voted \$80,000 for street improvement.

Jefferson county, Texas, votes on the 22nd of this month on a bond issue of \$500,000 for road building.

The Belton precinct of Bell county, Texas, votes this month on a road bond issue of \$150,000.

Davie county, North Carolina, votes on the 31st of this month on a bond issue of \$175,000 for roads.

Mingo county, West Virginia, will vote on a bond issue of \$400,000 for good roads.

The police jury of Caddo parish, Louisiana, has contracted for the construction of 14½ miles of good roads.

The city of Baltimore has plans already prepared for a 900-foot bridge across Gunpowder river a mile from the present Meredith street bridge, at a cost of \$150,000.

The city of Waycross, Georgia, will build three concrete bridges across the city canal.

Tarrant county, Texas, will bridge Trinity river on the outskirts of Fort Worth at a cost of about \$52,000.

Pasco county, Florida, has contracted for the construction of a bridge across Hillsboro river.

Caroline county, Maryland, has contracted for a draw bridge across Choptank river.

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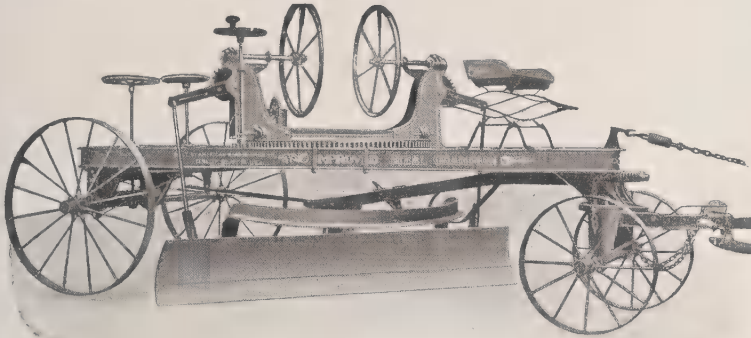
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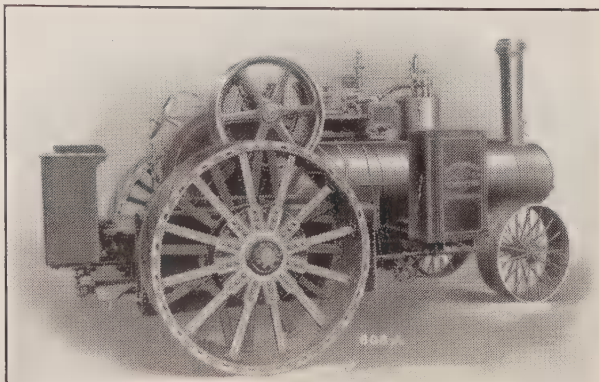
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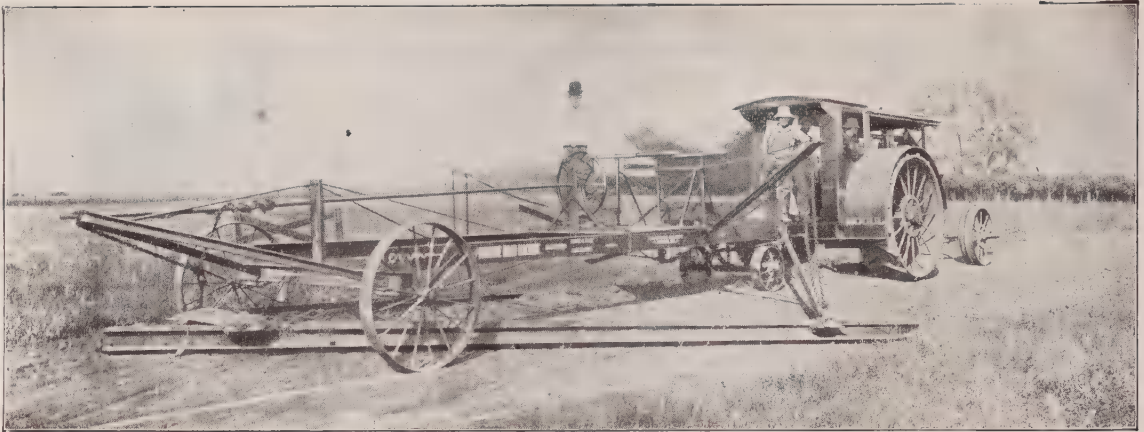
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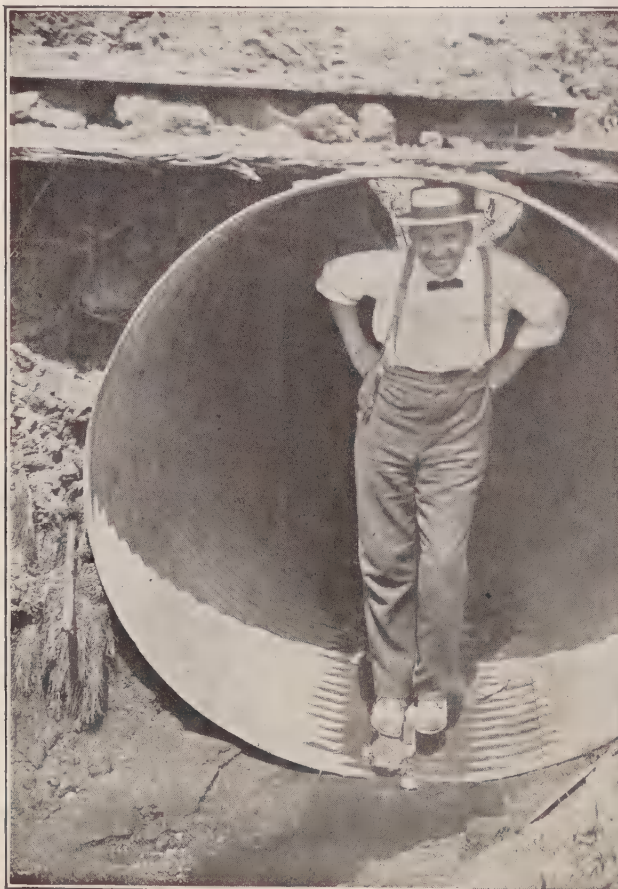
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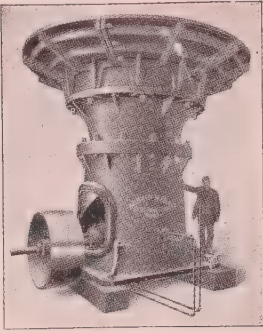
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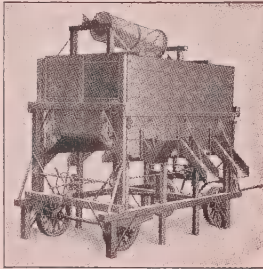
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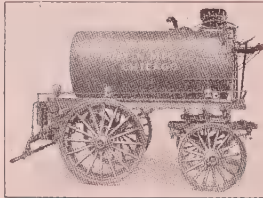
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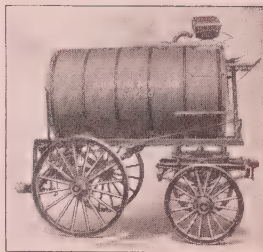
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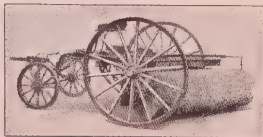
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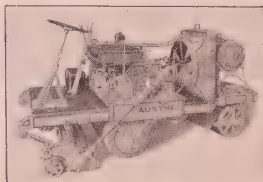
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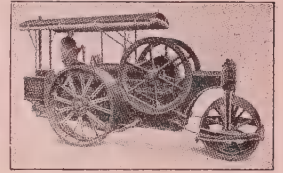
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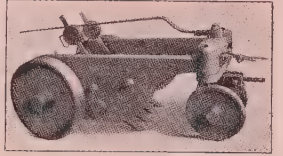
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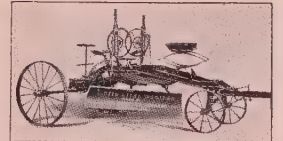
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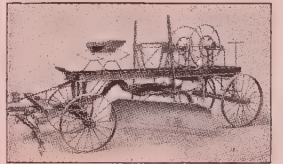
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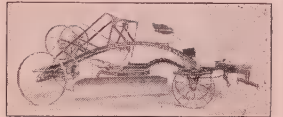
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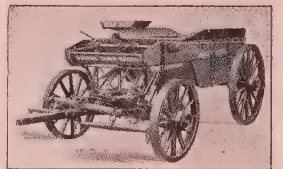
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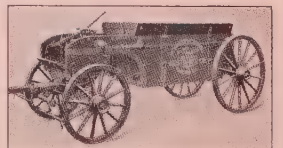
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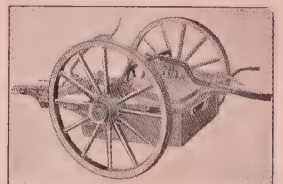
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SOUTHERN GOOD ROADS

Vol. VII. No. 6.

Lexington, N. C., June, 1913

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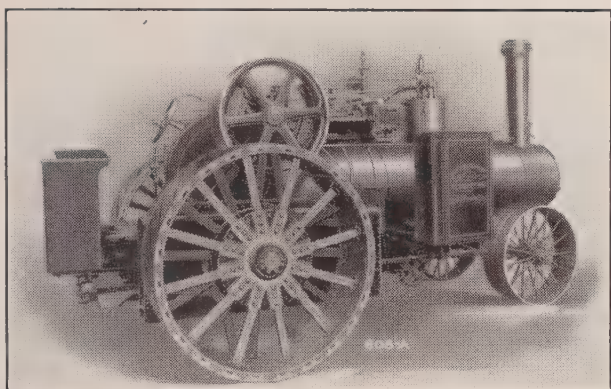
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lar to the railroad traffic survey which is frequently used in determining the desirability of new mileage for railroad systems.

The type of farm survey which has been developed within the last few years, is almost sufficient for a complete highway traffic survey and its deficiencies can probably be supplied with very little additional effort on the part of the observer.

It will be necessary, for example, to have some definite method of determining the distribution of radial market roads from the market centers. At the present time, in all cases which we have examined, it is



This piece of street in the outskirts of Baton Rouge, La., as every one can see, has "possibilities." It has since been improved and is one of the most beautiful streets in that city of beautiful streets

necessary to assume the number of main market roads which radiate from market centers, and we are now using six as the proper number.

To show the intimate relation which the farm surveys bear to the highway traffic surveys, it is interesting to examine the results obtained by the Cornell Experimental Station from the survey of farms in Tompkins county, New York, in the year 1908. The result of this investigation, as before mentioned, is published in Bulletin No. 295.

Tompkins county, in which Cornell university is situated, is in the center of the State of New York and fairly representative of a large area of New York farming country. The investigation in question was carried out by methods which had been developed by several previous years of work. Most of the results are based upon figures from 647 farms in the four townships of Ithaca, Lansing, Danby and Dryden; the area of these four townships is about 260 square miles, while the area of the whole county is about 422 square miles. It is of course, necessary in determining county wide

figures to extrapolate from these four townships to the remainder of the county.

It is possible to derive from the data of Bulletin No. 295 conclusions in regard to highways which should be as reliable in general as are the conclusions in regard to agricultural facts, which are represented in the tables. For example, we find that the average weight of farm produce which is sold and transported from the farm is little more than one-half ton per acre of land which is under cultivation. This is a fundamental fact on which all our calculations must be based.

Next in importance comes the average haul to market and not only this, but also showed the number of farms situated at the varying distances from market. Apparently the average distances from market was determined from the list of farms obtained and not by grouping farmers or individual roads. The average distance is given as 3.16 miles and is very low. The average for the United States is given in Bulletin No. 49 of the Bureau of Statistics, as hay 8.3; oats 7.3; buckwheat 8.2; wheat 9.5; and potatoes 8.2.

The distribution of these farms is shown in table No. 1. If this distribution is representative of the actual distribution of farms along the radial roads in these townships, it is so unexpected as to be extremely interesting. The table shows, for example, that the 142 farms are less than a mile; 124 about four miles and 26 about seven miles from market, whereas the number should increase with the square of the distance, if the farms were of the same size. Ithaca with 15,000 population is the largest market center and is reached by about six main roads of an average length of 10 miles. (See Tracing of Map in Map File, Office of Public Roads.)

The question of determining the average distance from market of farms in a given area is a very interesting one.

Certain assumptions must necessarily be made. Mr. Frank Andrews in Bulletin No. 49 Bureau of Statistics, U. S. Department of Agriculture, determines the average distance from the maximum distance. He says "Assuming the longest distance of any considerable number of farmers from a certain shipping point to be 12 miles, the area of the circle including the farmers using that shipping point would be 452 square miles. One-half of this area, or 226 square miles, is included within a circumference drawn with a radius of 8.5 miles from the shipping point. Hence one-half of the farmers may be assumed to haul from points distant less than 8.5 miles from the shipping point, and the other half to haul farther than 8.5 miles. This distance is, therefore, taken as the average hauled by all farmers using that shipping point."

This assumption does not involve the knowledge of how many roads radiate from the market point. The average distance from the farm to the shipping point, as determined by Mr. Andrews, does not, however, coincide with the distance which may be computed by assuming a definite number of radial roads from the shipping point with an equal maximum haul along each road. The average haul for that market will depend upon the number of roads we assume; but in no case will it be as great as the average haul used in Bulletin No. 49.

Mr. Andrews finds that the average haul "h" is given by the equation:

$$h = \frac{H}{2} \text{ where } H = \text{average maximum haul}$$

If we assume the number of radial roads to be six,

the average haul is determined by the equation:

$$h' = 2H'$$

For example, if the average maximum haul is taken as 12 miles, the average haul with six radial roads would be but 7.64 miles. The method that we use really determined the average length of haul as the distance from the market center to the center of gravity of the section of the country served by the individual road.

With the average haul of 3.16 miles deduced from the study in Tompkins county, the maximum haul would be thus almost five (5) miles. The total area surrounding each market would be in the neighborhood of $12\frac{1}{2}$ square miles.

When we determine the acreage production which is sold and hauled from the farms within this area, we can, with a fair degree of accuracy, measure the service of the six five mile radial roads leading to the shipping point.

In the four townships from which returns are recorded, the census of 1910 shows that 98.6 per cent or 232.7 square miles are in farms. The Cornell investigation shows that 70 per cent of the total farm area was in crops so that in the four townships in question there were about 104,262 acres of crops. The returns from 647 farms show that the average produce, including milk (see Table No. 1) sold from each cultivated acre was .5157 tons, so that if this figure is applied to the entire producing area of the four towns, we find that 53,768 tons of farm produce were marketed over the roads.

In order to determine the service of the market roads, in the four townships in question, we divide their area by $12\frac{1}{2}$ and we find there should be 21 five-mile roads grouped about 3.5 market centers. The aggregate miles of market road then is 105 miles. Similar figures may be deduced for the entire county and

are shown in the Table II of the bulletin referred to above.

There are various methods of procedure from this point to determine the value of road improvement. We have computed the total saving to the four townships and to the entire county which would accrue, if the roads were so improved that first the cost per ton per mile of hauling was reduced five cents on all produce, except market milk; second, the cost of hauling market milk was reduced 50 per cent, and the returns or price received for market produce increased by one per cent. of the recorded receipts.

To assume a decrease of five cents per ton mile for hauling on an improved road is a conservative figure. The Cornell bulletin states that the cost of hauling milk varies from four to seven per cent of its value, and that the hauling can be hired for about one-sixth of the actual cost when the individual farmer carries milk to the station. To assume that adequately improved roads would cut the cost of marketing milk in two is therefore reasonable. The value of opportunity in marketing over roads which are serviceable for an increased number of days in the year and in all weather is certainly worth one per cent. The total saving to the four townships would be \$18,932, and on the same basis to the county \$37,592. The total expenditure in this county for road purposes for all sources was only \$45,958.

The saving which we have computed is at the rate of \$180 per mile in the four townships or \$192 per mile in the entire county. Capitalized at five per cent, this annual saving would pay for improvement costing nearly \$3,600 per mile in the four townships or \$3,840 per mile in the county on these roads which apparently perform the service of market roads. The present tax levy on this mileage could thus be applied wholly to maintenance. It is interesting to note that the computation we have made shows that the market roads are



A Beautiful Spot Under the Willows. Within Two Minutes Walk From the Court House at Summerville, Georgia. An Old-Time, Picturesque Ford That Ought to be Replaced by a Good Bridge. There is a Fine Mineral Spring Under the Willows

only 18 per cent. of the total mileage both in the four townships and in the county.

There were in 1908, 24 miles of improved roads in the four townships and 45 miles in the whole county, but no account has been taken of this improved mileage in the above computation as no knowledge of its distribution was available.

There are certain striking facts noticed by the author of the Cornell bulletin. He says that although it is probably true that the best farms lie in the valleys and are consequently nearer the main roads, it is also



A new road in the great new State of Oklahoma

true that the value of farms decrease from \$40 per acre to \$19 per acre as the distance from market increase to 8 miles and that this decrease is not warranted by change in fertility. It is also remarked that even with the low average labor income of \$425 from 615 farms, the owner who lives within three miles of market makes about four times as much as is made by those who are about seven miles from market and furthermore it is concluded in this bulletin that the farmer can afford to pay five per cent interest on more valuable land near the market and still make much more from his labor. The term "more valuable land" here does not mean more fertile land but land more valuable to the farm as a business plant, because of its nearness to the shipping point.

It is quite apparent, therefore, that a whole new series of computation could be undertaken with a view to determining the relations between improved roads which bring the more remote districts from 50 to 100 per cent nearer the market in point of time consumed on the road. In the matter of agricultural credit of which much is now published, it is certainly apparent that the borrowing power of farms situated upon improved market roads will be increased. It appears also that more remote farms need capital to establish a proper balance between farm acreage and equipment and to operate with greater efficiency. It is quite common to find that the more remote and less prosperous districts pay a larger rate for tax purposes and that their roads are poor and often run over outrageous grades. Such districts as these get increasing returns from all forms of state or county aid.

In summing up the most important needs of the farmers, the Cornell bulletin remarks that nearly all the good farmers raise crops for sale. Cows are the most profitable kind of live stock in the market. The average cow does not pay. No dairyman who sells nothing but wholesale market milk is making a large profit and the obstacle has largely been in the sale of milk in small quantities. The farmers do not receive more than their share of the prosperity and in the past they received less than their share. Only one-

third of the farmers make more than that made by the hired men.

It would, therefore, seem that in this county, in which the conditions for agriculture are a little better than the average for the state and considerably better than the average for the country, if the labor income averages only \$423 and the disadvantages of farm life pointed out above are in any way due to lack of improved roads, there should be no hesitation on the part of the state, county or towns in spending more money to improve the market roads.

Mr. J. W. Strack, an eminent roadbuilder of the north west, who now holds the position of highway engineer of Spokane county, Washington, has joined the ranks of those who favor the building of roads on a concrete or other permanent base. He says:

"I wish it understood that I am opposed to make-shift roads and believe that if a road can not be completed with a concrete base it should only be temporarily graded that it may be completed at some future time. I have seen the experiments made in the city and



Section of Macadam Road built by Mr. Frank H. Flee through his fine estate, Cedar Lodge, near Thomasville, N. C. Mr. Flee has built several miles of fine public road without asking Davidson county for aid, but has built many miles of Macadam through his big estate, all open to the public

know that it is an injustice to the taxpayers to lay a paving or road without the concrete base." Mr. Strack declares that patent pavements and roads which are laid without the proper base are expensive experiments.

The board of awards of the city of Baltimore, Maryland, has awarded contracts for paving several streets, the whole amounting to \$331,335.13.

The Good Roads Germ

By HON. LEE LAMAR ROBINSON, Washington, D. C.

THE marvelous development of the motor machine from an industrial and other standpoints promises to be equalled in the near future by the natural accompaniment of such a movement, the gradual building in every state in the union of more and better highways. The good roads germ has fastened itself upon a big majority of the localities of the various states. Naturally, there are communities which are as yet not only indifferent to the movement but determinedly pulling in the other direction, but they will come into line in time. Legislative bodies all over the country are hearkening to the call. In the movement for more and better roads it is not alone the motorist and the

resulted in repair work to pikes and highways which would permit ordinary traffic only to be negotiated. In the last few years, though, great and powerful agencies have been at work and a transformation gradually is being wrought.

The motor machine was the pioneer in the work of real development. It caused the public to sit up and take notice; to realize to what extent that highways had become eyesores. Lincoln once said:

"He who controls the highway of a nation controls its destiny."

The truth of these words is being realized now. The militants who are back of the good roads projects are determined that the highways shall be controlled by the proper interests, that the good of the entire country may be subserved. Activity in the work of development is now the watchword and various agencies are committed to the task of improvement. One of the most powerful of these, the Department of Agriculture, through the Bureau of Public Roads, is doing much to awaken the country to a realization, not only of the need for good roads, but to the necessity for scientifically constructing them. Logan Waller Page, the head of the bureau, a man of technical training and untiring industry, is an optimist as well as a worker. He is indulging in dreams of the future in which model highways will play the most important part in the development of the country. Mr. Page is a practical dreamer, however, and insists on practical ideas being utilized in the work of his department.

The Bureau of Public Roads has sent its agents up and down the country building a piece of road here,



They know how to build sand-clay roads at Dodge City, Kansas. This is a sample of the work done around that city

motorecyclist who is to be congratulated on the progress already made, but the individual booster in the various localities who sees in this modern movement what he has long been looking forward to, quicker and more intimate connection between the town and the country, a highway closely approaching a boulevard to every school house and an accompanying advance in civilization.

The highway booster is the forerunner of a new era which will mark a commercial as well as a social development. The motorecyclist, while he has not in the past figured in the good roads movement as prominently as the autoist, is gradually coming into his own and the swift speeding little machines which annihilate distance and provide a new source of health and pleasure are now being recognized by all classes. The seeker after pleasure is the enthusiastic champion of the motorcycle while the business man is daily conceding its value for commercial purposes. The result has been that a permanent place has been fixed in the motor world for the smaller brother of the automobile. Like the automobile clubs, the motorcycle organizations are making themselves felt in connection with steps taken to bring about better highways, as well as in the realm of business and pleasure.

From colonial days up to the time of Lincoln the highways of the country, then more than now the chief arteries of trade and social intercourse, had been sadly neglected. From the time of Lincoln up to a few years ago, despite marvellous progress in other lines of national activity, road improvement had been permitted to lag to an extent almost unbelievable. In many great and populous states extreme necessity only had



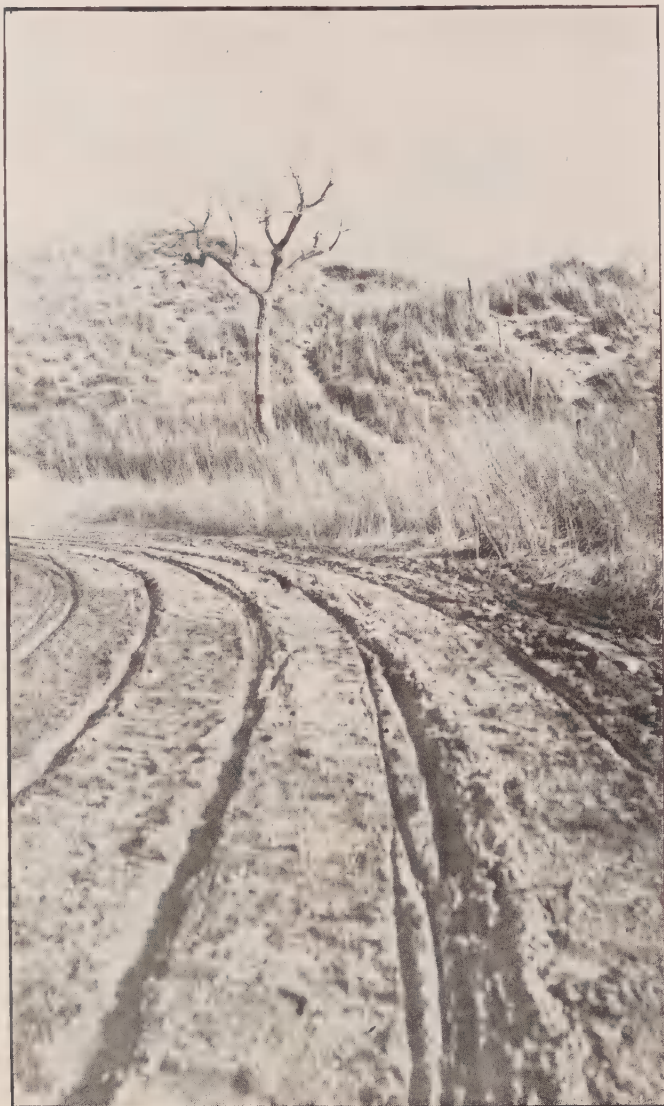
Another view of the Macadam road through the Fleece estate, near Thomasville, N. C.

aiding in the reconstruction of another there, and following up this work with return visits that observations may be made as to the results attained. Mr. Page is glad to take the public into his confidence and let it know what has been accomplished by his bureau. An application to him for information is welcomed.

Another agency which includes many forces brought into harmonious action in the fight for more and better highways is the army of public officers scattered over

the United States, from the governors of the commonwealths down to the road supervisors in the various districts. These Knights of the Dirt Road are bending every energy to the end that concrete results may be attained. Councilmen, mayors, trustees, commissioners, all are enlisted under the banner. This enthusiasm is not confined to the local officers or the members of the various legislatures; it has extended to the members of the two houses of congress.

The victory has been won as far as convincing a majority of the members of congress, as well as a majority of the members of most of the state legislatures, of



Gypsum Road Near Watonga, Oklahoma

the need for more and better roads from an industrial as well as from a social standpoint. Only the ways and means by which the plans already suggested are to be most effectively carried out remain to be considered. The proselyting in the way of campaigns to arouse the people has been more than successful. Federal aid to the various states is one plan suggested and a meeting was held in Washington in March to urge such a step. The improvement of the highways by the individual states, working along lines which reach down and take in the different counties, is another. In this connection, much has been done along the lines of employing convicts on the highways, notably in the south.

Various propositions on a gigantic scale have been

evolved by enthusiasts looking to the building of trans-continental highways, the money to be furnished by motor manufacturing concerns. Another plan includes the building of a cross continent road by the federal government to be used for army purposes, primarily, and for the purposes of the public at large, generally. Some of these plans may be classed as Utopian dreams but those back of them insist they are practical and they are going ahead with the preliminary work with much earnestness. One favorable sign is the interest being taken in the good roads propaganda by men of great means who assert they are willing to aid financially and otherwise. Vincent Astor, heir to the great fortune of Col. John Jacob Astor, is one of these. Gen. T. Coleman duPont, of Delaware, is another. Carl Fisher, who conceived the Indianapolis Speedway, backed by millions upon millions of capital among the manufacturers of motor cars and motor accessories, is another.

In fact, the good roads movement is one to conjure with these days. Even the organizations of women over the country have aligned themselves with the pioneers in this cause. The pendulum of public opinion is swinging towards closer and more pleasant communications between sections without relying exclusively on steamboat, trolley line or steam train service. In fact the time seems measurably close at hand when an aroused and an awakened public sentiment will insist that a modern public highway, a boulevard wherever possible, and a good, free pike where the boulevard is not practical, shall connect the extreme sections of the various states with the towns and the cities; that such highways are the most enduring and helpful monument which the people can construct.

The enthusiasm is not confined to the east and the middle west. Little Arizona, newest of all the commonwealths, has aligned itself with its brothers along the Atlantic sea-coasts and has declared its sympathy with the movement. Arizona has its highway commissioner the same as the populous states to the east. Towards the Canadian line little argument is needed to develop a healthy sentiment for good roads. To the south various organizations are at work, among them the Lakes to Gulf Highway Association, which plans to build a boulevard from the great lakes south by way of Louisville, past the birthplace of Abraham Lincoln, on to the Hermitage, the home of Andrew Jackson, and thence to the gulf. Once this is done this highway will connect at Indianapolis or some other central point with arms stretching towards New York, to the east, and San Francisco or Los Angeles, to the west. Then will all sections of this country be united and in the good old way.

William Wallin of Pocatello, Idaho, secretary of the Intermountain Good Roads association, has just issued an interesting pamphlet giving in detail the work done by this organization at its convention at Logan last June. At that time Boise, Idaho, was selected as the next meeting place and the officers are already planning to make the coming convention the largest ever held by the association.

The pamphlet gives complete details of the work done in various counties in the intermountain west during the past two years, the figures being furnished by the county commissioners of these counties. Photos of newly constructed highways in Utah and Idaho are published, as well as many points of interest which can be reached by automobile. Copies of this pamphlet will be mailed to all automobilists upon request to Mr. Wallin at Pocatello.

Hon. Jonathan Bourne's Federal Aid Plan

Hon. Jonathan Bourne, Jr., chairman of the congressional joint committee on federal aid in the construction of post roads, has proposed a bill to his committee that he thinks meets all of the problems involved in the matter of federal aid. Introducing his bill which is now published, with full explanations and arguments in favor of it, Mr. Bourne declares that any bill, to be satisfactory, must embody the following features

(1) A plan should be developed that would be satisfactory and acceptable to the federal government and the 48 states, representing, in effect, 49 different personal equations, thus insuring co-operation between the federal government and the states.

(2) A plan to be satisfactory must be practicable, simple, and so framed as to insure the most intelligent and honest expenditure of funds, whether contributed by the states or by the federal government, or both.

(3) The federal government's contribution or plan of co-operation must be such as to induce the states to undertake road construction, improvement, and maintenance actively, intelligently, and extensively.

(4) The plan should not only encourage construction but insure improvement and maintenance of roads already built or to be built.

(5) The money expended to-day should benefit, and co-ordinate with the money to be expended years hence; in other words, the expenditures of to-day should be so made as to correlate with the expenditures of the future.

(6) Federal supervision of expenditures of the federal money should not interfere with the rights of states or lead to a federal espionage irritating to the states and resulting in the building up of a great federal bureau.

(7) Any plan of federal aid or co-operation must insure an equitable apportionment among the 48 states.

Mr. Bourne says: For a number of months I sought in vain for a key to the problem, but finally an idea occurred to me from which I evolved a plan that, after weeks of careful analysis and study, appeals to me as having merit, and I therefore respectfully submit the same herewith in the form of a suggested bill for your consideration, criticism, modification, adoption, or rejection:

Be it enacted by the Senate and House of Representatives in congress assembled, That in order to establish, construct, improve, or maintain public roads that are now or may hereafter be needed for use as post roads, military roads, or for interstate commerce, there be, and hereby is, created a fund to be known as the United States Highway Fund. Said fund shall be raised in the manner herein provided, but the treasurer of the United States is hereby authorized to receive and place to the credit of said fund any money that may be contributed from other sources and to expend the same upon the order of the United States Highway Commission or in accordance with the conditions of the contribution.

Sec. 2. That for the purpose of providing money for the United States Highway Fund the Secretary of the Treasury is hereby authorized and directed to issue and sell by popular subscription and upon a pro rata allotment basis, at not less than par, bonds of the United States in such form as he may prescribe and in denominations of \$20 or multiples of that sum, said bonds to be payable 50 years from the date of issue and to bear interest, payable semiannually, at the rate of 3

per cent per annum, the total amount of said bonds not to exceed \$1,000,000,000 and the issue and sale of same not to exceed such amounts as may be necessary from time to time to enable the Treasurer of the United States to make payments from the United States highway fund to the several states in accordance with the provisions of this act. Bonds issued under authority of this act or the income therefrom shall not be subject to taxation of any kind for any purpose.

Sec. 3. That before any state shall be entitled to take advantage of the provisions of the act, it shall establish by law a state highway commission having general supervision of road construction and improvement in that state, which said commission shall have general supervision of the expenditure of money received from the United States Highway Fund, subject only to the provisions of this act and of state laws not inconsistent therewith.

Sec. 4. That the United States Highway Fund shall be apportioned and credited to the several states in the following manner: The United States Highway Commission hereinafter created, shall ascertain in the most practicable manner from the best information available the total land area, the population according to the last federal census, the total assessed valuation of all taxable property, and the total mileage of public highways in each of the several states, and shall compute the percentage of the total of each of these four items possessed by each state. They shall then compute the average of the four percentages for each state, and this average shall be the per cent of the \$1,000,000,000 United States Highway Fund that shall be apportioned and credited to each state. Said commission shall notify the treasurer of the United States of the result of their ascertainment and computation, which shall be made as of a date to be fixed by the commission. Such fund so apportioned shall be paid to the states only in accordance with the provisions of this act.

Sec. 5. That whenever any state, through its duly authorized agents, shall apply for any part of its share of the United States Highway Fund, but not exceeding 20 per cent thereof in any year, and shall deposit with the treasurer of the United States its bonds for such amount payable in 50 years and bearing interest, payable semiannually, at the rate of 4 per cent per annum, said treasurer of the United States shall issue and sell by popular subscription and upon a pro rata allotment basis United States highway bonds herein authorized to the amount that may be necessary to pay to said state the amount of money applied for, and upon the sale of said bonds shall pay over the proceeds to the custodian of the public funds of the state: Provided, That the bonds of any state shall not be accepted if the total amount of bonds of such state, including the bonds issued to take advantage of the provisions of this act, shall exceed 10 per cent of the amount of the assessed valuation of all taxable property in such state. When the treasurer of the United States shall receive any payment of interest on state bonds deposited in the manner above provided he shall devote three-fourths thereof to the payment of the interest due on the corresponding United States highway bonds and one-fourth, herein designated as a sinking fund, he shall deposit in the treasury of the United States to be used from time to time as the general funds of the United States are used. The treasurer of the United States shall keep an account with each

state that shall deposit bonds and receive funds under the provisions of this act, and shall credit said state with interest compounded annually at the rate of 3 per cent per annum on the sinking funds paid in. At the time of the maturity of the bonds deposited by any state, if all payments of interest have been made when due, the treasurer of the United States shall cancel said bonds and return them to the state issuing the same, without requiring any payment of the principal.

Sec. 6. That on the 1st day of February of each year the treasurer of the United States shall pay to the custodian of the public funds of each state, from any funds in the treasury not otherwise appropriated, an amount of money equal to 2 per cent of the amount of state bonds said state has on deposit with the treasurer of the United States under the provisions of this act. The money so paid shall be expended by said state only in the maintenance of public highways. The treasurer of the United States shall withhold the payment of money to any state under the provisions of this section in the event that such state default in payment of any interest due or in the event that the United States Highway Commission herein created shall certify to said United States Treasurer that money theretofore paid to said state for maintenance purposes has not been expended with reasonable effectiveness for the maintenance of public highways or that the state has

failed to expend an equal amount of its own funds during the preceding 12 months for the same purpose.

Sec. 7. There is hereby created a United States Highway Commission, to be composed of the chairman of the Senate Committee on Post Offices and Post Roads, the chairman of the House Committee on Post Offices and Public Roads. Such commission shall have only an advisory voice in the expenditure of the United States Highway Fund in the several states. It shall have its head office in the District of Columbia, but may create highway divisions, never exceeding in number one for each state and may maintain a division office in charge of a United States highway engineer in each division. Said commission shall have power to employ such clerical and expert assistance as may be provided for by appropriations made by congress from time to time, and may require the assistance and co-operation of the officers and employees of any department in its work.

Sec. 8. For the further aid and encouragement of highway improvement in the several states, the United States Highway Commission shall maintain in the district of Columbia a school for special instruction in practical highway and bridge engineering, the entrance requirements of which school shall include completion of preparatory courses in civil engineering and such other studies as the commission shall specify qualifying the student to enter upon the special study of



"THE ROAD ETERNAL"

Section of Canal Road Cayuhoga County, Ohio, Laid in 1909. Concrete Base 4 Inches Thick, Sand Base, Concrete Curb, Cement Filler Vitrified Brick, 14 Feet Wide

the practical problems of highway and bridge engineering. The rules, regulations, and curriculum of said school shall provide for instruction for two years for one student from each congressional district, selected by competitive examination, but if there be no qualified applicant for admission from any congressional district such vacancy may be filled by the admission of a student from some other congressional district in the same state. Upon the admission of a student to the school of highway engineering such student shall be paid as traveling expenses 4 cents for each mile of distance necessarily traveled in going from his home to Washington, D. C., and at the end of each calendar month thereafter during the continuance of such student in said school he shall be paid \$50 to cover living and incidental expenses. The United States Highway Commission shall make rules and regulations for the management of said school and shall have entire control of same, subject only to the Constitution and laws of the United States. In connection with said school said commission shall maintain a testing laboratory in which said commission shall cause tests to be made of road or bridge building material free of charge at the request of the duly authorized highway officials of any state.

Sec. 9. That for the purpose of carrying out the provisions of this act, there is hereby appropriated out of any moneys in the United States Treasury not otherwise appropriated, the following amounts, or so much thereof, as may be necessary:

For the renting of suitable quarters for the United States Highway Commission in the District of Columbia, \$———.

For the renting of suitable quarters for the school of highway and bridge engineering, \$———.

For the payment of salaries of clerical and expert assistance for the United States Highway Commission, \$———.

For the payment of salaries of instructors in the school of highway and bridge engineering, \$———.

For the purchase of testing laboratory equipment and office furniture and supplies, \$———.

For the payment of the salaries of ——— division engineers, \$———.

For the renting of quarters for ——— division engineers, \$———.

Apportioning the road funds under the act according to area population, assessed valuations and road mileage, Mr. Bourne prepared a table which shows the following apportionments for the states of the south: Alabama, \$17,200,000; Arkansas, \$14,400,000; Kentucky, \$19,800,000; Louisiana, \$13,200,000; Mississippi, \$14,800,000; Missouri, \$33,500,000; North Carolina, \$17,400,000; Oklahoma, \$25,300,000; South Carolina, \$11,500,000; Tennessee, \$17,000,000; Florida, \$9,500,000; Texas, \$56,600,000; Virginia, \$17,300,000; West Virginia, \$13,200,000.

Space limitations forbid the printing of the entire pamphlet here. It is a singularly clear and forceful expression of the federal aid idea and a very convincing appeal for his plan. He sums up the advantages of his plan in the following words:

"In conclusion, I realize that the suggested bill can undoubtedly be improved, but after many weeks' thought and study on the subject it appeals to my mind as presenting a plan of which at least some portions can be utilized to advantage. The strong features are:

"Incentive to the states for activity and expedition in road construction by utilization of the superior credit of the government.

"The establishment of practical and desirable co-

operation between the federal government and the states.

"Teamwork between the federal specialists on good roads and the state specialists, without surserbence in the state instrumentality to any federal bureau or department.

"The establishment of a practical concrete plan for a long period with definite knowledge as to the liability of the federal government (its liability in the endorsement of the state credit being inconsequential in one viewpoint, namely, that the state would ever default either on principal or interest of its bonds.)

"A bond limitation of 10 per cent of assessed property valuation, with realization that default in payment of interest or principal to the federal government must result in discontinuance of future federal assistance and cessation of immigration or further outside investment in the state, would eliminate possibility of any default.

"Under my plan the maximum annual liability of the federal government would be \$20,000,000 contribution for maintenance, thus relieving members of both branches of congress from the tremendous pressure for increased appropriations in various congressional districts and states.

"The minimization of the possibility of building up a great federal machine necessarily resultant upon direct supervision by a federal bureau or giving a department head the right of determination as to whether federal funds should continue or not.

"The establishment of a federal academy for the development and training of specialists in road and bridge construction, thus supplying for the states and districts a corps of trained specialists and also a medium for the best information bearing on the subject and creating an instrumentality for consultation and intelligence of ideas.

"My plan rather prevents the possibility of centralization of powers in the federal government, protects and preserves the rights of the states, improves the state instrumentalities in efficiency, and establishes co-operation, practicable and desirable, between the federal government and the states.

"The adoption of this comprehensive plan insures an opportunity, extending over a period of fifty years, for the expenditure of three billions of dollars in improvement and maintenance of wagon roads in the United States, thus giving useful employment to many people and providing systematic and intelligent highway construction, resulting in the United States securing what would probably be the best and most extensive system of highways in the world and increasing our national wealth many, many times the amount of the investment."

An election is to be held at Athens, Texas, at an early date to vote on a good roads bond issue of \$100,000 for Precinct No. 1, Henderson county.

Marion county, West Virginia, has been asking for bids for the construction of 32 miles of roads.

The city of Cordele, Georgia, one of the smaller cities of the Cracker State and one of the most progressive, is preparing to spend \$100,000 in street improvements.

Tampa, Florida, is convinced of the superiority of brick as a paving material. Bids are being asked for laying 200,000 square yards of brick pavement and 10 miles of granite curb.

Annual Report of Good Roads Committee of the North Carolina T. P. A.

The T. P. A's. of North Carolina are taking great interest in good roads, as shown by the able report made by Hon. Robt. J. Donahue, of Winston-Salem, the chairman of the good roads committee at their annual convention held in Greensboro May 9th-10th, 1913. The report follows:

Revenue.

The total amount of money raised by special tax for road work (expended for maintenance, construction, and interest and sinking fund on bond issues)	\$1,118,942**
Amount of bonds issued during 1912	965,000*
Number of county bond issues	13
Number of township bond issues	32
Number of counties using convicts on public roads	37
Approximately the number of convicts used during 1912	1,500
Number of counties leasing convicts to other counties	37

Road Mileage.

Number of miles of public roads in the state . .	48,870
Number of miles of macadam, water-bound, built during 1912	71¾
Average cost of the macadam per mile	\$3,150
Number of miles of sand-clay road built during 1912	742½
Average cost per mile of constructing sand-clay road	\$730
Number of miles of gravel road built during 1912	250
Average cost per mile of building gravel road . .	\$1,000
Number of miles of specially surfaced road built during 1912, (tar, asphalt, or bituminous macadam)	21¼
Number of miles of dirt road graded during 1912	642½
Total number of miles of road built and surfaced in 1912	1,061¾
Total number of miles improved, including surfaced and graded road, during 1912	1,728
Number of miles of unimproved road in the state	43,767

** (This does not include all the poll tax, accurate figures for which I have not been able to secure. In some counties there is also a special dog tax.)

* These bond issues have been by the counties or townships.

I find that the spirit as expressed by the members of the T. P. A. is in accord with the good roads work, knowing it to be one of the greatest agencies at our

everything we eat and wear comes from the hills, the valleys, the rivers or the oceans, and good roads bring contentment to the producers of all we consume.

We do not find, where good roads have come, the desire among young men and women to leave the farm. They are contented and happy. Why? Because, as often as they like, five or fifteen miles over a good road is only a matter of a few minutes drive; but



Earth road between Charlotte and Matthews, Mecklenburg county, N. C.

where bad roads exist, it means hours of travel through slush and mud; and for about four months of the year, they must remain at home; and where these latter conditions exist the young men and women leave and crowd the cities, and who can blame them? The human being is not a groundhog, content to nurse his paws half of every season. We must have social life and entertainment. Good roads are an agency



Touring through Cedar Lodge Farm, the fine estate of Mr. Frank H. Fleer, near Thomasville, N. C. Mr. Fleer built this road at his own cost



Yorkville Macadam road, near Charlotte, N. C. Note the banks at the sides of the fills to protect the sides from washing. The water is carried along the fills and let out at convenient places

command for building up our rural homeland, where are bred and born the very backbone of our nation. Why should we not encourage an agency to the very fullest extent upon which we are so dependent, for

that keeps our homes happy; our labor on the farms; reduces the cost of living; keeps wages higher; reduces crime, for statistics show that where our country people are educated, they are freer from crime, purer in heart, and more virtuous than those in our crowded cities.

I may be "ten years ahead of the times" as some

one said of that good and great statesman, William J. Bryan—but if I am indulging in an Utopian dream, I feel confident that the day will soon dawn on the people all over our land when they will realize that the best cure for vice so prevalent in our cities—the cure for poverty and misery, the cure for idleness and loafing, as well as the thirst for strong drink, would be a great national movement to distribute the people in our crowded cities out on our billions of acres of unused lands, and such a movement could only be carried out by the establishment and maintenance of good roads.

North Carolina is doing her part. The members of the T. P. A. will do their part. Let us all fall in line and join in the cry for good roads!

The recent effort of Mr. Bryan looking toward international peace, set me to thinking what a wonderful thing it would be if all the civilized countries of the world could be brought together in a peace compact for five years, or better still, for all time—and



Stretch of fine gravel road eight miles from Greensboro, N. C., in the fine county of Guilford

thus stop the expenditure of billions of dollars annually in preparation for imaginary wars that seldom come, and let some of that vast amount be expended on the highways of this great country of ours.

Another thought steals through the mind of the thoughtful traveling man as he roams over the country: Would it not be a good thing for our standing army, and would they not greatly prefer an arrangement by which they could have one-third more pay and let them work on the public highways five hours and drill three hours daily, and give them better quarters and more privileges? Would they not be better developed physically on account of the little manual labor and be better soldiers if called upon to shoulder arms in defense of the country? Would it not be better if the officers of our great army devoted a part of their attention toward questions relating to the development of our national highways as well as towards questions of warfare?

Let us as T. P. A's. not be content with dreaming dreams, but let us advocate the organization of some great national movement which shall have for its object the building of highways all over this, our beloved homeland.

Shreveport, Louisiana, is engaged in smoothing the rough edges and building connecting links between the streets of the city and the gravel roads of Caddo parish. There is available for the work \$101,500.

Interesting Facts About Roads.

"The Good Roads Year Book for 1913," compiled and published by the American Highways Association, gives a vast deal of information concerning good roads. For example:

Missouri has 4,755 miles of improved roads, which is 4.4 per cent of its total of 107,923 miles of roads, improved and unimproved. Kansas, with 98,302 miles of public roads, has improved only 374 miles, or 0.38 per cent. But Indiana has 24,955 miles of improved highways, 36.7 per cent of all its public roads. The percentage in Massachusetts is higher—56.8 per cent. But that is because the state is smaller. It has 8,674 miles of improved roads. New York has 15,592 miles of good roads out of a total of 79,279 highway miles.

Indiana and Massachusetts represent the two leading methods of road construction—by locality and by state. Massachusetts has built most of its roads by state aid, or even wholly at state cost. Indiana's greater mileage (though at smaller cost) has been constructed at local expense by the benefit assessment plan.

In Indiana, if the owners of a majority of the acres of land within one mile of a road proposed to be improved petition the county court for its improvement the court estimates the cost and then assesses benefits and damages to the land within two miles of the road. The strip four miles wide pays all the cost.

This Indiana law differs from the new Missouri Special Benefit District Road Law in that all the authority is with the county court instead of being divided between the county court and the local district commissioners. The principle of payment, however, is practically the same in the two laws.

Among the nations the French are the greatest road builders. France has 520,088 miles of road, and of these 355,000 are improved highways in the connected national, department and vicinal systems. These roads of France represent an investment of 1,100 million dollars. They are the chief factor in making France, relative to its population, the wealthiest country in the world, with its wealth the most generally diffused.

Arizona for the Southern National Highway.

That Arizona is interested in the great Southern National Highway which is to run from Washington, D. C. to San Diego, California, is shown by the following resolution passed by the state senate of Arizona on May 1st, and by the house on May 7th:

Whereas, the several legislatures of the states of North Carolina, South Carolina, Tennessee and Arkansas have adopted concurrent resolutions favoring the establishing of a Southern National Highway from the Atlantic to the Pacific, sufficiently far south to be used at all seasons, and especially in the winter when the more northerly routes are blocked by snow; and,

Whereas, the said resolutions so adopted have recommended that said Highway pass through the state of Arizona; and,

Whereas, the entire south is using every effort to secure federal aid for the construction of this Southern National Highway,

Now, Therefore, be it Resolved, that the senate and house of representatives of the first legislature of the state of Arizona, concur in extending to the legislatures of the several states its thanks and appreciation for the interest manifested in the proposed Southern National Highway, and do earnestly recommend that all legislatures of the states upon the proposed route and the entire southwest do use every effort to secure federal aid for the construction of this Southern National Highway as herein designated.

Street Pavements---Their Selection, Care and Maintenance

By GEORGE W. TILLSON

Consulting Engineer of the Borough President, Borough of Brooklyn, New York City

THE question of constructing roads and pavements has been studied for about six thousand years. Despite this, however, the question seems in almost as unsettled condition to-day as it was a hundred years ago, particularly in regard to roads. Wheeled vehicles have been in use for traffic purposes to any great extent only for the last three or four hundred years, so that the question did not receive so great attention during the early stages of civilization.

The general proposition of the improvement of roads received a great impetus some fifteen years ago when bicycles came into general use. When their popularity began to decline, automobiles were introduced, so that road work was not allowed to slacken, but rather gained in force, and it was the particular use of the automobile which called further attention to the need of the improvement in pavements in our large cities. A pavement that would be satisfactory for heavy traffic or for vehicles moving at the rate of eight or ten miles an hour, might prove quite unsatisfactory for vehicles moving at the rate of twenty-five or thirty miles an hour, and so great is the traffic in our largest cities that vehicles should move as rapidly as possible, in order to prevent possible congestion, provided that the safety of pedestrians is not endangered.

Street pavements have been in use in this country for nearly three hundred years, but of those standard to-day not one mile existed thirty-five years ago; and it was not until some sixty years ago that any material advance was made in the improvement of pavements, the prevailing material at that time being cobblestone. During this period a great many experiments in pavements have been made with different materials and laid in different ways. In these experiments pavements have been laid with asphalt, brick, cement, gravel, India rubber, iron, shells, slag blocks, and even leather, glass and hay. Some of these experiments were unsuccessful, but the great majority were entirely unsuccessful. The result has been that at the present time the pavements that are considered standard are constructed of stone, wood, brick, or the bituminous materials. Under this last head are included sheet asphalt, asphalt block bitulithic.

The problem of determining what is the proper material with which to pave a city's streets is a very perplexing one. Often the question is asked: What is the best pavement? The question is indefinite and must necessarily receive an indefinite reply. It would be just as easy to determine what is the best material for a lady's gown as to determine what is the best material for a pavement: it depends entirely upon the conditions under which it is to be used. The city official whose duty it is to determine upon the material to be used must know first the different properties of the pavements, and, second, the conditions which they must meet. By that is meant the quantity and character of the traffic on the streets and the character of the abutting property—whether wholesale or retail business office buildings, or residential. Taking up briefly the qualities of the different pavements, it can be said that, as a general proposition, stone is the best

pavement for heavy traffic. It is, however, noisy and hard upon vehicles and also upon horses. It is probably, however, the best, all things considered, for heavy traffic and wholesale streets. It often happens, however, that the traffic on streets of other character is heavy and that the noise produced by the traffic on a stone street is extremely objectionable. This is especially the case where churches, schools or hospitals are located on the streets. In such cases it is imperative that as noiseless a pavement as possible should be laid, no matter if the expense be greater than natural economy would suggest. If the grade is not too heavy the best material would be wood blocks, as they will withstand heavy traffic in a surprising manner and also are almost absolutely noiseless. Should the grade, however, exceed 2 per cent. it would be advisable to use asphalt blocks, as this material is far less slippery than the wood, and, while it probably would not last as long, still, on account of its lack of slipperiness, it would be more desirable. If, however, the grade is too steep for asphalt blocks, then recourse must be had to stone. If stone should be used it should be laid in such a way as to make it as nearly noiseless as possible. This can be accomplished by having the surface of the blocks made smooth and the joints made small and filled with some substance that will be as resilient as possible, so that the noise will not be transmitted from block to block, but will be that caused only by the action of the traffic upon each individual block. An ideal substance for this purpose would be granulated cork held together with some bituminous material, or India rubber. Neither of these materials, however, would be practicable for general use. What is commonly used is a bituminous filler.

It may be said that while stone may be a desirable pavement for heavy traffic, yet in some states of our country there is no stone which is suitable for paving purposes and freight rates make the bringing of the material from the natural quarries prohibitive. This is undoubtedly true, but Nature seems to have provided for this exigency by furnishing a clay in the Central West which can be burned into a brick or block that will withstand heavy traffic to a surprising degree. It is absolutely necessary in any block pavement to have the blocks of a uniform grade so that they will not wear unevenly. When brick pavements were first used a great deal of trouble occurred on this account. The National Paving Brick Manufacturers' Association early recognized this, and by a great deal of experimental and research work developed a method of testing by which it is possible to determine in advance whether the brick will make a satisfactory pavement. While this association was undoubtedly working for its own interests, it is entitled to a great deal of credit for having brought about this result.

Wood Pavements.

The wood pavements being laid at the present time are known as creosoted pavements and have been in use to a certain extent some twelve or fourteen years. They have given good satisfaction and a large amount

has been laid. On December 31, 1911, 5,670,000 square yards of this material were in existence in the United States, and it was expected that between two and two and a half million square yards would be laid during 1912; and in New York City alone 320,000 square yards have been contracted for in this same year. This pavement in general use is almost ideal, its greatest objection being its slipperiness. This can be obviated to a great extent by taking care that it be not laid on excessive grades and that during wet, damp or frosty weather it be sprinkled with sand.

Brick Pavement.

This pavement has already been alluded to in connection with heavy traffic streets, but it deserves more than passing notice. In the section where other material can only be obtained at great expense, it has been used very largely during the last thirty years, and with excellent results. The clays of the Central West, under the clever treatment of the brick manufacturers, have produced brick the wearing qualities of which are claimed by many to be equal to or even greater than that of granite. It makes a smooth, durable, and, where produced, a cheap pavement, and one which can be easily repaired, and it has deservedly come into very general use in localities where freight rates will permit its use.

Sheet Asphalt.

This material was first laid some thirty-five years

ago and its use has extended over the country to a remarkable extent. The pavement is smooth and pleasing to the sight, easily repaired, and of not excessive cost. There is probably a larger amount of it being laid at the present time in the different cities than of any other material, as it makes a very pleasing pavement. While it is probably not quite as durable as other pavements and is somewhat more noisy than wood, still, when all things are taken into consideration, it is an extremely valuable material.

Asphalt Block.

Another form of the asphalt pavement is that known as asphalt block. The mineral aggregate of the blocks is somewhat coarser than that of the sheet asphalt, and consequently the pavement when laid is less slippery. The blocks are manufactured at a central plant, under regular and even conditions, so that the blocks themselves are probably as nearly alike as it is possible to make an artificial product. The blocks were first made 5 inches deep, but this depth has gradually been reduced until a depth of 3 inches has come into general use, and even 2 inches upon residential streets. This pavement can be used on much steeper grades than sheet asphalt, although of course it is suitable for level grades. It is very generally and satisfactorily used.

Bitulithic Pavement.

This pavement was first laid about ten years ago. A



FINE BRICK ROAD

This is a Section of the Ansel Road Skirting Rockefeller Park, Cleveland, O. It Was Laid in 1907 and a Concrete Foundation With Sand Cushion and Cement Filler

gentleman who had formerly been interested in asphalt pavements conceived the idea of improving the then existing methods of laying a macadam pavement by filling a portion of the voids with a bituminous product or bitumen mixed with some other material. By the gradual elaboration of his original idea there was evolved a pavement which is now known as "bitulithic." It is essentially a macadam pavement of selected and graded stone, so that the voids in the stone shall be as small as possible, the binder being a bitumen, either coal tar or asphalt, both having been used. The pavement, being formed of coarse materials, can be laid on quite steep grades with satisfactory results. The writer has had no personal experience with this material, but has observed its construction and use in other cities. It has been laid very extensively in this country and would undoubtedly have been used to a greater extent if it were not patented. It is considered as standard and ranks with asphalt pavements.

The different properties of these pavements can be expressed in figures so as to arrive, with some degree of correctness, at the proper pavement to be used when the conditions on the streets are known. The accompanying diagram shows these properties, according to the ideas of the writer. It is not expected that these are absolutely correct, and they will vary according to locality, but the principle is the important thing and the figures can be varied to suit the ideas of anyone wishing to apply the table. Its use can be shown briefly as follows, as is seen in the lower part of the diagram:

	Per c.	Granite	Wood	Asphalt	Brick
Cheapness	14	8	8	14	11
Durability	21	21	16	15	16
Easiness of Cleaning	15	10	14	14	15
Light Resistance to traffic	15	13	14	12	15
Non-slipperiness	7	7	4	5	6
Ease of maintenance	10	10	8	6	6
Favorableness to travel	5	2	5	4	3
Sanitariness	13	9	13	12	10
Totals	100	80	82	82	82
Cheapness eliminated		72	74	68	71

HEAVY TRAFFIC				HIGH CLASS RESIDENTIAL			
Gran.	Wood	Asph.	Brick	Gran.	Wood	Asph.	Brick
21	16	15	16	10	14	14	15
13	14	12	15	7	4	5	6
7	4	5	6	2	5	4	3
10	8	6	6	9	13	12	10
51	42	38	43	28	36	35	34

For ordinary residential district, eliminating light resistance to traffic, the totals are: Granite, 67, Wood 68, Asphalt, 70, Brick 67.

Take for instance a heavy traffic street; then of the qualities mentioned for the different kinds of pavement, cheapness, easiness of cleaning, favorableness to travel and sanitariness can be eliminated, as those qualities will not be pertinent. The result gives, as will be seen, a value of 51 for granite, 43 for brick, 42 for wood and 38 for asphalt, which is probably the order in which most engineers would arrange them. For a high class residential street, where the cost of the pavement need not be considered, both cheapness and durability can be eliminated, also light resistance to

traffic. This gives a result of 36 for wood, 35 for asphalt, 34 for brick and 28 for granite. For an ordinary residential street, where the property owners wish a good pavement but cannot afford to pay for any luxury, the only item that should be eliminated is light resistance to traffic; that gives as a result—asphalt 70, wood 68, granite and brick 67. As has been said, these results are based upon the opinion of the writer and in any event are not to be considered conclusive, but they give a somewhat systematic way of determining the character of material to be used.

Knowing, however, the kind of material is not sufficient for the determining official. He should know also all the requirements of the streets to be paved. In



Gravel Road at Hyattsville, Md., immediately after a heavy rain.

order to do this he should have a record of the amount and character of traffic upon each street or upon typical streets. Of course it is not necessary to get a detailed census of traffic on all residential streets, but of those where by inspection it can be told to what class each belongs. Very little has been done in this country in this line, and not very much in Europe, but it is necessary in order to make a proper selection of different paving materials. The words "light" and "heavy" as applied to traffic are indefinite, as what is heavy traffic in one city would be considered light traffic in another, and the character of the traffic should be taken into consideration as well as the quantity. In these days of rubber-tired vehicles it is manifest that a certain amount of rubber-tired traffic per foot of roadway would have a very different effect upon a pavement than the same amount with steel-tired vehicles.

In a book recently published in England and written

by Mr. Francis Wood, Borough Surveyer of Fulham, London, in speaking of the life of wood pavements, it is stated that the wear of the best Swedish soft wood is .061 inch per annum for 100 tons per foot of effective width of roadway per day. It is assumed that a 5-inch wood block will stand a total wear of 2.2 inches before being replaced, and by this assumption the probable life of the pavement is arrived at.

To just what extent this principle can be applied in actual practice on all pavements is problematical, but if a scheme of this kind could be worked out and the actual wear of pavement caused by a certain amount of traffic be determined, the principles could be applied to cities large or small if the amount of traffic were known. It must be remembered, however, that the life of certain pavements is determined by other conditions than wear and tear of traffic, as, for instance, untreated wood or the bituminous pavements, or, on light traffic streets, by the probable life of the preservative in a treated wood pavement. Stone and brick should not be acted upon by the elements, and their life in a pavement should be directly comparable to the amount of traffic.

When the city official has determined with what material any street is to be paved, he will often find that there is a difference of opinion as to the material, held by people owning property, people doing business on the street, and truckmen who are using it for trucking purposes. If, for instance, the street is lined with office buildings, or if it be a retail business street, he will find a noiseless pavement is desired, and these people have no interest whatever in the use of the street by teams except in so far as it may interfere with them. The truckmen, on the other hand, care nothing for the people doing business on the street, looking after their own interests simply. The official, therefore, who has to determine the best material for the street from an economic standpoint must discriminate carefully between the wishes of the interested parties and make his decision only after careful study.

If it were possible to set aside streets for different uses, as, for instance, if streets connecting railroad stations or connecting railroad stations with public docks could be given up to heavy traffic, these streets could be treated according to their uses, and other streets could, in a similar way, be set aside for the use of automobiles and light traffic and paved accordingly. This is an extremely difficult problem, especially in a well built up city, but by careful study its solution can be approximated to a certain degree.

But almost as important a matter as selecting and laying a material for a pavement is its care after it has been once laid. This point has received much less attention than it has deserved in the past in our American cities. If a pavement be kept in constant repair its life will be very much longer than if neglected and repaired only once or twice a year. Some years ago a prominent city in America sent its engineer abroad to study the conditions and learn how to construct a permanent pavement. The engineer returned and reported that the only permanent thing he could find about pavements was the repairs. This condition holds good to-day and always will.

There is another use of streets that also tends to destroy the pavements and that is the construction in them of subsurface work. If the facts were collated regarding the amount of disturbance in our streets for this purpose probably every engineer even who has to do with the matter would be surprised. In the Borough of Brooklyn in 1911 the Bureau of Highways laid sufficient pavement over openings and trenches that had been made in the streets to pave a roadway 30 feet

wide and seven miles long in pavements out of guarantee alone, and when it is known that there are some three or four million yards of pavement in the Borough under guarantee an idea of the magnitude of this work can be obtained. These facts are not peculiar to Brooklyn and it is undoubtedly true that a proportionate amount of street openings has been made in other cities of the country. With the present system of operating public service corporations in the cities, when so much of their work is underground, the number of openings made in the pavement must necessarily be large. This must be accepted as a fact, and the real problem is how to reduce the number to a minimum and to have the openings, when made, repaved as soon as possible.

In the City of New York the Board of Estimate and Apportionment will not order a street paved until water, gas and sewer mains have been laid, and in the Borough of Brooklyn when a sewer is laid in an unpaved street connections are made to the adjacent



The McConnel earth road, out from Greensboro, N. C.

property, whether occupied or not, as a part of the sewer contract and their cost assessed against the lots benefitted. Other cities are taking up this matter and solving it each in its own way.

The importance of this street opening work would be more fully appreciated if the incidental damage to the pavement on account of these openings could be known. From a study of the condition of pavements which have been laid in front of cemeteries, parks, churches, etc., where street openings are not often necessary, the writer believes that, as a whole, street pavements, at least in the business part of any city, are damaged to an extent of 25 per cent. of their cost by these street openings. This estimate may seem large, but the writer fully believes that it is conservative and that in order for any city to have its streets in good condition at all times it must not only pave them with the proper materials and in the proper manner, but must keep them thoroughly in repair, both on account of the damage caused by wear and tear and that caused by street openings for subsurface work.

Durant, Oklahoma, will pave 13 blocks with asphaltic concrete pavement, 36 feet wide, at a cost of \$40,000.

The state roads commission of Maryland has awarded contracts for road-building in various counties of the state to the amount of \$234,478.02.

LaFayette county, Mississippi, is asking for bids on a large number of concrete bridges and culverts in connection with road building.



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OUR MOUNTAIN NUMBER.

The July number of Southern Good Roads, which will mark the magazine's beginning of Volume 8, will be devoted almost exclusively road progress in the southern Appalachian region. There will be articles of unusual worth and merit by Dr. Joseph Hyde Pratt, Mr. N. Buckner, Col. Fred A. Olds, and others. Fine photographs showing many of the fine roads of the mountains and some of the wonderful scenery around Asheville and further west, in the "Sapphire Country" and the "Land of the Sky," will accompany the articles.

The number will be of great value to the motorist and a source of delight to every lover of the mountains.

MR. BOURNE'S IDEA.

In the plan for federal aid in road-building, proposed by Ex-Senator Jonathan Bourne, Jr., of Oregon, which is outlined in this number of Southern Good Roads, readers of this magazine will recognize readily the plan for state aid in road-building devised by Mr. W. S. Wilson, of Raleigh, and advocated in these pages with his accustomed ability by Mr. P. D. Gold, Jr., one of the state's leading good roads enthusiasts. Mr. Bourne simply appropriates Mr. Wilson's idea, and makes a little wider application of it.

It is a good idea, too, and all the objection we have

to Mr. Bourne's using it, is that he did not give Mr. Wilson credit for it. He might at least have called it the "Wilson idea" or the "North Carolina idea," for the good roads enthusiasts of North Carolina have been working for just such a system for the last four years. Two years ago the bill passed the Senate, but was killed by the House. At the 1913 session, it successfully passed the House, only to be killed by the Senate. The men backing the plan are not out of heart about it and will be found fighting for it again when the solons drift back to Raleigh for another session.

So far as we can see, the plan ought to appeal to a majority of the members of congress. There is nothing wild or improbable about the scheme. It merely takes advantage of the federal government's superior credit to secure funds for road-building. The federal government is protected against all loss by the state bonds it holds and the interest charges will always be paid regularly. There is no chance at all for Uncle Sam to lose and progressive states would jump at the chance to get road-building funds on such terms.

There is no reason why Mr. Wilson's state plan should not be adopted also. It would fit into the Bourne national plan in a way to leave nothing to be desired. With the state pledging its credit and turning over the money to the counties, taking county bonds to be discharged after 40 to 50 years of interest paying, and aiding the counties with funds secured by the use of the credit of the national government, wonderful things might be accomplished in this land of ours.

Both state aid and national aid are coming and up to the present, Messrs. Wilson and Bourne have put forward the most reasonable and the most feasible methods of securing state and federal aid.

GOOD ROADS LEGISLATION IN FLORIDA.

As Southern Good Roads goes to press the people of Florida are very much stirred up over the question of good roads legislation. The legislature is in session and while it has in it many enthusiastic good roads advocates, it is following the same old deadly trail that all other southern legislatures have followed, from time immemorial, the devious turnings and twistings of partisan politics, responsible more than all things else for the lack of progressiveness that marks many of the states of the south.

The people are demanding above everything else that road-building in the state be systematized and safeguards thrown around the spending of the people's money. One of the principal bills before the legislature now is one backed by the Good Roads Association of Florida providing for the establishment of a state highway commission and the placing at the disposal of the various counties of the state expert engineering assistance in the laying out and building of roads.

So deeply interested in this bill are the people that there is talk, and very serious talk, too, of asking Gov-

ernor Trammel to call a special session of the legislature to take action on it.

The proposition to bond the state for \$50,000,000 to build a system of state roads, while it did not seem to set well with the majority of the legislators, and stands no show of passage, is a great idea and the very fact that a body of serious, clear-headed business men had

faith enough in their state, its resources and its future to advocate it and work for it earnestly and persistently, will have its effect.

Florida is coming out of the mud and that right soon. The people have made up their minds to that effect and no legislature, or half dozen legislatures, can thwart their will.

Meeting of Old Trails Road Association

The National Old Trails Road Association which met last month at Kansas City, Missouri, was well attended and many interesting addresses were made. Miss Elizabeth Gentry delivered an interesting lecture on the Santa Fe Trail, illustrated with stereopticon views. There were speeches by Hon. Walter Williams, of Kansas City, Judge H. C. Gilbert, of Columbia, Missouri, and others, including former representative in congress from the Tacoma, Washington, district, Stanton Warburton. Mr. Warburton's address probably attracted more attention and provoked more discussion than any other feature of the convention.

"The government soon or late must build and maintain national roads," said Mr. Warburton. "Any other system of extensive road building only opens a door to graft and makes impossible a national system of highways. The Shackleford Bill is a pork barrel scheme providing for state aid in small amounts, and the Swanson Bill, providing for appropriations to states according to their population, is worse.

"I claim above all else for my plan that it treats every state alike, large or small, rich or poor, and, furthermore, that my system will serve the greatest number of people. My plan provides for eighteen thousand miles of highways, and, on or within ten miles of these highways, live two-thirds of the inhabitants of the United States.

"I would have the government build the best road that can be built and by that I do not mean a macadamized road, for that is not the best. If it were you would have macadamized roads in Kansas City. I will insist upon eighteen thousand miles of pavement in my system, pavement equal to the best in the streets of your city. My roads will cost from \$15,000 to \$20,000 a mile and it means a total cost of about 300 million dollars. That figure at first staggers congressmen to whom I have outlined my project. They ask breathlessly, 'How will you raise the money?'

"I propose to obtain the money by increasing the tobacco tax, the least taxed luxury in America. By increasing the tobacco tax to where it was in 1879 the government will acquire 70 million dollars a year, which will build my system and pay for it in five years."

Judge J. M. Lowe, of Kansas City, was unanimously re-elected president of the association at its closing meeting and his fine work, and that of the secretary, Mr. Frank Davis, of Herrington, Kans., was highly praised in the nominating speeches. Mr. Davis was re-elected secretary and Mr. E. S. Ralph, of Springfield, Ohio, was again elected treasurer. Other officers named were C. N. Cotton of Gallup, N. M., first vice-president; Miss Elizabeth Gentry of Kansas City, honorary vice-president, and Walter Williams of Columbia, Mo., advisory vice-president.

The various state delegations in caucus named vice

presidents and state organizers, who were elected by the association. Those selected were:

California—George G. Hutchinson, Barstow; Ralph E. Swing, San Bernardino.

Arizona—John R. Whiteside, Kingsman; Cy Vabre, Flagstaff.

New Mexico—H. M. Shields, Dawson; C. C. Manning, Gallup.

Colorado—J. F. Sherman, Trinidad; Henry Hunter, Trinidad.

Kansas—O. C. Billings, Marion; C. W. Black, Council Grove.

Missouri—W. E. Jamison, Fulton; W. B. Waddell, Lexington.

Illinois—C. W. Shimet, Casey; C. M. Curry, Effingham.

Indiana—C. A. Kenyon, Indianapolis; Hal Donbaugh, Terre Haute.

Ohio—B. A. Matthews, Columbus; Jesse Taylor, Jamestown.

Farm and Fireside, an agricultural paper of high standing, never fails to boost the good roads cause when occasion arises. Recently this journal had a striking article on the effect of bad roads on education and it made out a case. In the article appeared this very striking paragraph:

"Many children are killed each year walking railroad tracks to school. Why? They have no roads to walk on. Many children each year have no schools to go to. Why? The roads are so bad there is no profit in farming, no money for schools, no progress, no growth, no ambition. Hundreds of thousands of children yearly have to do with a little schooling, a little part of a term at school—why? Because father needs their help on the farm—he isn't making money enough to spare his children's time for school days, because he has to pay so much for hauling his crops to market he has no profit left for extra hired help!"

The legislature of North Carolina passed a bill authorizing the counties of Forsyth and Davie to build a bridge across the Yadkin river to cost not more than \$25,000.

The commissioners of Harrison county, West Virginia, the B. & O. Railway, and the Monongahela Valley Traction Co. will build a bridge across the Monongahela river connecting Lumberport and Haywood at a cost of \$32,000.

A bridge is to be built across the Arkansas river at Fort Smith, Arkansas, connecting that town with Sequoyah county, Oklahoma.

Wilson county, Tennessee, will build two expensive bridges soon.

Smith County, Texas, Road Investigating Committee Makes Report.

Smith county, Texas, is preparing to spend a large amount of money on good roads and in order that the money might be spent intelligently a committee of three prominent citizens was named to go to Pike county, Alabama and Sumter county, Georgia, to look over the fine sand-clay roads of these counties and make report. This committee was composed of Judge Odom, Mr. S. H. Cox and Mr. J. L. Jackson. When they returned to Tyler, the hustling county seat of Smith county, last month, they had an interesting report to make. The Tyler Times had an interesting story of the mass-meeting that followed their return and what the three investigators had to say about it.

Judge Odom was quoted as saying:

"We had a splendid trip in all particulars. We visited Troy, Ala., and Americus, Ga. We were taken in an automobile over 75 miles of roads near Troy. In Pike county, Troy being the county site, the roads are built of sand and clay. Some have been built seven years, some five years, and some are now being built. The cost ranges from \$800 to \$1200. Both methods are employed in building roads—bonds and special tax. The roads are kept up at a very small cost. The split log drag and roller are used.

"The crown road is 18 feet wide, while the main thoroughfare is in no instance over 24 feet. The roads are high in the middle and have a good drainage, which of course allows the water to run off fast and prevents washing. Road crews keep up the roads. Farmers say their property has enhanced from 25 per cent to 100 per cent in value since the good roads were built. In Montgomery county we found gravel roads, costing from \$3500 to \$5000 per mile, but I did not like them as well as I do the sand-clay roads, and I do not believe they are as satisfactory.

"At Americus, Ga., we drove over several good roads. There are about 400 miles in that county. They have been built about 5 years. About the same condition prevailed at Americus that we found at Troy. Everybody is well pleased with the good roads, and they are going right ahead and building more of them. Most of the roads are built by bonds. There is no question but that just as good roads can be built in Smith county as are built in either Alabama and Georgia."

Mr. Cox said: "I am thoroughly convinced that we can build even better sand-clay roads here than they have in Alabama or Georgia, for my judgment is that we have better clay with which to build the roads. I am inclined to believe, however, that they will cost more here, due to the fact that wages are higher than in the old states. We drove in an automobile for miles and miles at a pretty fast clip, and were charmed with the country. Farmers there are considerably ahead of Smith county farmers. One reason, I believe, is because they have good roads over which to haul their produce to market. It can be done at so much less cost. I heard but one man object to the good roads and when I tell you his objection, you will see that there is not much in it. He said that good roads caused his negro hands to go to town so much that they lost too much time from the farm work. Before the good roads were built, it was such a task to go to town, that they were satisfied to go only one day in the week. We found the farmers happy and prosperous. They are well pleased with the good roads, and are building more of them. The property has increased in value from 25 per cent to doubling, and but few farms are for sale where there are good roads. Roads are built by

both special tax and bonds. The cost of keeping up the roads is from \$5 to \$7 per mile per year.

"The split log drag and steam roller are used, with special emphasis on the split log drag. We had a fine trip. We were pleasantly and courteously treated, and when we build good roads in Smith county like they have in Georgia and Alabama, we will all be surprised at the prosperity that will come to our country."

Second Good Roads Year Book.

Following the recent publication of the Good Roads Year Book which presents the road situation in the United States to date, the American Highway Association, has begun the issuance of a series of instructive papers presenting the most important phases of road improvement from the standpoint of both the layman and the engineer.

Among the first to be issued is a reprint of the address by W. W. Finley, president of the Southern Railway, at the recent American Road Congress on "Good Roads and the Cost of Living." Mr. Finley holds that the cost of living is largely an economic question and that efforts should be turned toward increasing the area of farm land under cultivation and increasing the yield of farm products per acre. He points to the well known fact that prospective farm settlers are largely governed by railroad and public road facilities and that when these are not adequate farm operations are discouraged.

"Increasing farm products by getting more people on to the land and by bringing a large area under more intense cultivation is largely a matter of transportation," said Mr. Finley.

Concerning public roads as feeders to railways, Mr. Finley says: "May it not be a fact that the transportation needs of many localities that seem to be waiting on railway construction would be met more satisfactorily and more comprehensively by a system of good roads connecting them with existing railways? The railway should be located with reference to the main traffic channels. It can no more take the place of the wagon road for the collection and distribution of traffic in a rural community than the wagon road can replace it as a main highway of commerce. Considered as parts of a general transportation system the railway and the wagon road supplement each other, and I believe that this relation should be recognized in the formulation of plans for road improvement."

Among other papers to be issued will be those which deal with the construction and maintenance of all types of road, the selection and testing of road materials, adequate accounting systems for the expenditure and safe guarding of road funds, the use of convict labor in road improvement, instruction in highway engineering in schools and colleges, the beautification of road sides.

The American Highway Association is composed of upwards of 2000 of the leading men and women of the nation and is conducting a great campaign of good roads education and reform throughout the United States. Its President is Logan Waller Page, Director, U. S. Office of Public Roads and its secretary is J. E. Pennybacker, former Chief of Road Management in the Department of Agriculture, and afterward Chief Statistician for the Joint Congressional Committee on Federal Aid in the Construction of Post Roads. The headquarters of the association are in the Colorado Building at Washington.

Opelika, Alabama, has contracted for 50,000 square yards of street paving.

Road-Building, Road-Boosting and Road-Boosters Throughout the Nation

On May 13th, Governor Ernest Lister, of the state of Washington, issued the following proclamation:

"I, Ernest Lister, governor of the state of Washington, do hereby declare and designate Saturday, May 24, as 'Good Roads Day' and request that all commercial organizations, automobile associations, school districts, farmers' organizations and all citizens of the state assist in the work of improving and bettering road conditions in their respective localities by assisting in the building and repairing of roads on the day fixed.

"I would also further request that all school districts in the state set aside a part of the school hours on Friday, May 23, for a discussion and education in relation to highway construction to the end that teachers and pupils will take an active interest in the 'Good Roads' movement and assist with the work on the following day, the one herein designated as 'Good Roads Day.'"

* * *

The little town of Monte Vista, Colorado, seems to have a way all its own in getting things done. A few weeks ago the Monte Vista people wanted to build a new road to Platoro. Believing that the way to build a road is to build it, they declared a civic holiday, arranged for free automobiles to carry people to various points on the proposed road, and then sent the following letter to everyone who was interested:

"You and your shovel are expected out Thursday.

"By proclamation, Thursday, April 24, is decreed a civic holiday to build a road to Platoro. Every man, old and young, sane and insane, is expected to join in the good cause.

"If you are a dead one, let us find it out.

"Bring your lunch and a healthy shovel.

"Free autos start from town hall Thursday, 6:30 a. m."

* * *

John N. Carlisle, state highway commissioner of New York, has appointed George A. Ricker, a Buffalo engineer, as First Deputy, salary \$6,000, and Royal K. Fuller, of New York, as secretary, salary \$5,000.

Mr. Fuller, who has been attached to the New York Herald staff, succeeds Charles P. Dillon, of Saranac Lake, who is to be retained in a responsible position in the department.

* * *

Another good roads club has been formed in Oregon—the Eastern Multnomah Good Roads Club at Columbia, Ore. Grant Bell was elected president R. P. Rasmussen was elected secretary, and F. Benefield chosen treasurer. This club was formed especially for the bettering of highways along both sides of the Sandy river.

* * *

Good roads boosters sometimes meet with the appreciation due their efforts in this world, but not often. As a general thing they do not please everybody and there are always enough kickers to prevent any public expression of appreciation on a large scale. It is not always so, however, as the following dispatch from historic old St. Augustine, Florida, will show:

A pretty scene was enacted Saturday afternoon when Mr. Albert Lewis, a regular winter resident was

presented with a loving cup from the citizens of St. Augustine and St. Johns county. Hon. E. Noble Calhoun, made the presentation in a few words, which most eloquently voiced the esteem felt by the citizens of St. Augustine, and the people of the county, for that distinguished gentleman, Albert Lewis, and their appreciation of all he has done for the city, and county, not only as a good roads builder, but in various other ways.

Mr. Lewis has done more for good roads in the county than any other citizen. He has a force of men working on road work the year round, not only here, but in his native state. He says on his return this fall he will go after good roads with a vim.

Following the presentation of the loving cup to Mr. Lewis, Mrs. Lewis was presented with a beautiful bouquet of white carnations by W. P. Genovar, as a companion remembrance to the cup. About fifty of St. Augustine's best-known citizens were at the depot when the presentation was made and to bid the family goodbye.

* * *

Thirteen of the sixty-two counties have thus far accepted the conditions for securing their share of the new state highway commission's first apportionment of 318,000 to aid in improving roads in all parts of Colorado, and work upon many important stretches of road will be started at once. The commission is urging the other counties to accept the respective propositions made them and make as extensive improvements as possible before the opening of the tourist season.

* * *

A sociability run, to be followed by a good roads rally at Grand Junction, Colo., is being planned by the Colorado-Utah Midland Trail association for about the first of June. Many cars from Denver, Idaho Springs and Glenwood Springs, Colo., Salt Lake City, Provo, Price and Green River, Utah, and other points along this link of the trail have been promised, and the promoters of the enterprise also are hoping to secure delegates from Nevada, California, Nebraska and Kansas.

* * *

With the adjournment of the Ohio general assembly it is seen that considerable good roads legislation was brought about. In all four laws were passed, bearing on the subject of good roads. One of the laws provides for a tax of a half-mill on the state duplicate for road improvement, which will bring in approximately \$3,500,000 yearly; another for the use of split-log drags on the roads; a third for the improvement of the old National highway; and the fourth for the codification of all of the road laws of the state.

* * *

Road-building enthusiasm is on the increase around Baton Rouge, Louisiana, and it is taking the form of concrete results. Last month the voters of Third Ward, East Baton Rouge parish, by a majority of 41, voted a twenty-year three mill good road tax, which will aggregate \$68,000. The Third Ward is the largest assessed country ward in the parish, carrying an assessment of \$2,500,000 for 1913. The roads to be used are as follows: Bayou Sara road, six miles; plank road, seven miles; Greenwell Springs road, five miles. These

roads, of the model gravel plan, respectively, run to Bayou Sara, Clinton and Greensburg, seats of contiguous parishes. The tax provides also for a model dirt road on the highway from the upper end of the proposed plank model gravel road, and running east toward Puckett and Deerford post offices, in the northern part of the parish. With the model road running to Hope Villa, which has been approved by State Engineer Atkinson, these will give Baton Rouge thirty-three miles of good roads.

* * *

The physicians of Scott county, Virginia, hit upon a novel way of aiding in the good roads campaign in that county which has for its purpose the issuance of bonds for building roads. They have announced that if the election goes adversely and the people of the county do not recognize the need for better highways they will be compelled to double their prices for professional services. The doctors contend that the inadequate and unsafe roads render travel dangerous to themselves and their horses and that their carriages are quickly ruined by the rough usage.

* * *

The Ohio state highway commission has notified the commissioners of each of the counties of the state in the flooded district that an amount of approximately \$12,000 would be immediately available for the repair of roads and bridges, occasioned by the recent flood. It is the usual plan for the state highway department to give counties aid in building new roads, but this year the money will be used exclusively in repair work.

* * *

Attorney General Hogan has held that the Quinlisk amendment to the Warnes motor law, recently enacted by the Ohio general assembly which provides for an equal distribution of the surplus money, derived from the registration of cars in Ohio, among the various counties of the state for road improvement, is constitutional. It is held by the attorney general that as roads may be considered both of a local and state-wide nature, the principle that taxes are to be spent where raised, may be disregarded.

* * *

The Alabama Good Roads Association's executive committee held a meeting on Tuesday, May 6th, for the purpose of discussing and planning a campaign for education along good roads lines throughout the state. That day was Hon. Oscar W. Underwood's 51st birthday and the committee sent him this telegram of congratulations:

"The Alabama Good Roads Association extends to its vice president, honored and active member on this his 51st natal day, our hearty congratulations and wish that his journey shall be 50 more over better roads that he has championed with his colleagues of the Alabama Good Roads association for 16 years.

"JOHN CRAFT, President.

"JOHN W. O'NEILL, Vice-Pres.

"J. A. ROUNTREE, Secretary."

* * *

Addressing a good roads meeting recently Congressman W. P. Borland, of Missouri, summed up the federal aid situation admirably. Among other things he brought out and emphasized this idea, which has been mentioned often in these pages but which should be continually kept before the minds of the people:

"But here is the idea that must occur to every thinking man. We do not have to improve the 2,150,000 miles of highways in the United States. That need not stagger any man's imagination. Experience has

shown, at the very threshold of this subject, that 90 per cent of all the traffic on roads goes over less than 10 per cent of the roads. If we had a system of good roads leading fairly into every section of the country, within the reasonable reach of the majority of the citizens and producers and taxpayers of the country, that system would be a vast advantage over the present system of isolated local control of highways."

* * *

A rousing good roads meeting was held at Meridian, Texas, last month, at which good roads boosters from Bexar, Blanco, Burnett, Bosque, Lampassas, Coryelle, Hamilton, Somervell, Johnson, and Tarrant counties were in attendance. One of the most interesting features was an address on improved highway by Engineer Tarvilla of St. Louis who is superintending the road work in Tarrant county.

* * *

The Association of American Portland Cement Manufacturers, in session at Chicago last month, agreed that each member of the association should donate one per cent of its annual output of cement for the next three years for the "Ocean to Ocean National Highway" now being promoted by automobile manufacturers and others.

Nearly \$4,000,000 has been subscribed for this great highway by manufacturers and this donation will bring the total to \$10,000,000, practically enough to build the road.

* * *

The good roads and prosperity tour over the proposed highways of the Chicago-Grand Rapids-Mackinaw Way Association, starting July 7 and concluding July 11, will be made noteworthy by the presence of Governor Ferris as a guest, the purpose of the tour being to stimulate interest in the proposed highway.

* * *

The greatest "bee" Michigan has ever known will occur June 9, when hundreds of residents of the shore counties from Bay City to Mackinaw City will turn out and do road work for a day, their object being to complete a continuous good road from one end of the district to the other.

Over 4,000 days' work of man and team have already been pledged by the farmers living along the route of the road. The township of Posen in Presque Isle county, has taken the lead in this work, over 1,500 days having been pledged by its residents.

The work will be done under the state specifications, so that the state reward may be secured. State Highway Commissioner Rogers has agreed to send men to make the required surveys and to advise as to the best methods of building.

* * *

The need of an accurate traffic census for roads is becoming apparent to road-builders all over the nation, and up-to-date highway engineers will no longer build a road until they have ascertained correctly the amount of traffic it will have to bear to the end that the road may be properly graded and surfaced. Concerning this very important question the Engineering News said recently:

"Without knowing the wear a road has there is absolutely no way of telling whether it is good or bad; only a careful traffic census can determine this. Roads too costly have been constructed in some places; in other places roads unsuited to the traffic have been built. In view of this well known fact it is evident that a traffic census is an essential to economy in nearly all road building. Imagine a bridge designer mak-

ing plans for a structure without anything more than a rough guess whether it was to be used by steam railways or trolley cars, and we have an idea of the absurdity of proceeding with road building without traffic data."

* * *

The Rock Island Savings Bank, Rock Island, Illinois, has gone into the campaign for good roads in earnest. Not only have the officers of the bank been active in promoting the road dragging contest started in this county, but they have decided to do a little boosting all their own. To do this they have had a rubber stamp made and all of the envelopes sent out from the bank are stamped on the back with the following admonition to the farmers:

"If you want good roads now, drain and drag now."

If is a good scheme and a campaign that ought to bring results. The idea is not copyrighted and the suggestion has been made that every bank and business house in the land should use it. It would help a great deal.

* * *

Judge Gilbert, addressing the National Old Trails Road Association at Kansas City last month, called attention to the fact that the most necessary means of transportation, the public roads of the country, are most poorly maintained.

"The government has left the farmers sticking in the mud at an annual cost of 2 billion dollars," he said. "The necessity of the government constructing and maintaining roads was recognized by the framers of the constitution. This duty has been neglected because of the steam railway. The motor car has given an incentive to resume the work of building such systems."

* * *

It is interesting to note that at its meeting last month the National Old Trails Road Association changed the date of its annual meeting to March 29th of each year. This action was taken to commemorate the signing of the first bill establishing a national highway by President Thomas Jefferson, March 29, 1806.

* * *

One of the most important recent announcements in the manufacturing world is that of the appointment of W. W. Ramsey as General Sales Manager of the J. I. Case T. M. Company, Inc., of Racine, Wis. Mr. Ramsey succeeds C. J. Farney, who becomes assistant treasurer.

Mr. Ramsey's period of service with the company dates back to 1893. On January 15th of this year he was given a position at the Nashville, Tenn., branch house. The next year he was appointed manager of this branch, which position he held until 1900, when he was transferred to Dallas, Texas as branch house manager. Here he remained until 1903, when the company called him to the home office at Racine to fill the position of Assistant Sales Manager. In 1905, by another upward step, he became Division Sales Manager. It is from this position that he now assumes the duties of General Sales Manager.

Further announcements are those of the appointments of F. R. Washburn, former branch house manager at Spokane, Wash., as Division Sales Manager to succeed Mr. Ramsey, and of Stephen Bull II, grandson of Stephen Bull, one of the founders of the company, as assistant secretary.

* * *

W. C. Hendrie, head of a big rubber company, has been investigating the road-building situation in the southwest with a view of making a report to a group

of bankers covering expenditures in road work in the various states west of the Colorado-Kansas line and south of the northern Utah-Nevada-California lines.

On this report will be based in a large measure the expenditures in bonds and other forms of commercial paper with which the banks interested will be prepared to back automobile, auto truck, auto engine and tire projects now under consideration.

The Hendrie report will show that before the opening of the Panama exposition in San Francisco in 1915, more than \$40,000,000 will be expended for good roads in Colorado, Arizona, New Mexico, Nevada, California and Utah, and that, as a result of this great work, the field in motor vehicle financing will be practically unlimited for the next ten years.

* * *

The Florida state senate committee on public roads and highways has reported favorably Senator Stringer's bill providing for the building of a system of good roads in this state, with an amendment cutting down the amount of bonds authorized to be issued just one-half.

The senator's bill provided that the state should be authorized to issue fifty million dollars of bonds for good roads.

The committee thought twenty-five millions would be enough, and reported an amendment cutting it down to that amount.

Senator Stringer is very optimistic over the prospects of the passage of the bill.

* * *

Illinois, in 1907, caused to be enumerated the travel over the roads at a few important points, and in March, 1913, Highway Engineer Johnson writes: "I am sure we never collected any data on which I feel that I can place greater reliability than our traffic census data. It has been, all things considered, the most satisfactory investigation that we have attempted."

Massachusetts tried making a traffic census in 1909, and went into the subject on a larger scale in 1912. In August and October, 1912, counts were made at 160 stations at different points in the state, each covering a full week of time, and twelve to eighteen hours a day, according to location. The results enable the highway commission to make plans for not only carrying for the present travel, but also to provide for the increase that is bound to come.

* * *

The selection of a state highway engineer is one of the most important questions that confronts a state when it takes up the work of improving its roads under state supervision, and this word of admonition and advice from the Little Rock, Arkansas, Gazette of May 1st, is worth while:

Reuben G. Dye, commissioner of lands, highways and improvements, who is to appoint the state highway engineer, has, we are told, been deluged with applications for that position.

But how many of these applicants have had the specialized training in the science of road building and the year of experience in the building of highways that the man should have had who is to direct the expenditure of the millions of dollars that will probably be spent in Arkansas within the next few years in the building of roads?

* * *

Arcadia, Florida, will spend \$40,000 for the construction of brick pavements.

Beaumont, Texas, has contracted for a large amount of modern paving and sidewalks.

GOOD ROADS NOTES

GATHERED HERE *and* THERE

Alabama.

A news special from Huntsville, Alabama, brings encouraging reports from Madison county. During the first week in May and the last week in April, applications for more than fifty miles of new pikes were placed in the hands of the county commissioners of Madison. A short time ago the commissioners adopted a resolution providing that the county place roads wherever wanted when the property owners will donate rights of way forty feet wide and furnish material free of cost. The resolution was thought at the time to be the most forward step ever taken in the good roads movement there. There are already nearly 250 miles of pike in this county and the applications for more than fifty additional miles come from less than half of the precincts in the county. It is stated that four new steel bridges will be built this year unless the road and bridge fund is exhausted beforehand. The new bridges will be placed at important points and when they are put up, it will be possible to come into Huntsville from any well settled locality in Madison county regardless of high waters.

* * *

Florida.

Mr. John H. Williams, a prominent good roads man of Jacksonville, Florida, returning to that city recently from the state capitol at Tallahassee, gave The Metropolis an interview which that paper states shows the correct status of good roads legislation in the legislature, which is in session.

The State Good Roads Association had prepared a bill creating a State Highway Commission and a state road engineer. This bill was introduced by the Hon. I. L. Farris at the request of the legislative committee of the Good Roads Association, which convened recently in Tallahassee.

The bill, as prepared by the association, met with some opposition, as it was thought that too much authority was given to the county commissioners in the issuance of certificates of indebtedness.

This objection has been removed by a provision requiring the county commissioners to submit the question of the issuance of such certificates to the qualified voters, for their approval in any county where such certificates are sought to be issued.

Mr. Williams stated that a new bill embodying some other minor amendments was drafted as a committee substitute and the same was considered by the house committee on roads and bridges. He was invited, as a representative of the Good Roads Association, to appear before the committee. At this hearing the bill was thoroughly discussed and analyzed. The discussion showed that the committee as a whole, was unanimous in its desire to have some measure enacted that would impartially aid every county and section in the state in building hard surfaced roads.

It was finally decided by a large majority of the committee to report the bill favorably as a committee substitute for House Bill No. 20. There were only two dissenting votes, namely, Messrs. Taylor of Madison and Andrews of Bradford. Mr. Andrews explained his vote, saying that on account of peculiar conditions in his county he voted no, but that personally he was in favor of the bill, as well as any measure that would aid the good roads movement. Mr. Taylor also stated

that he was heartily in favor of good roads and hoped that the legislature would pass some measure that would be a practical help to the various counties in the state, in the intelligent construction of hard surfaced roadways.

Mr. Williams stated further that he had interviewed many of the legislators and there was a strong sentiment in favor of good roads legislation, and he had little doubt that this legislature would enact some measure of this character before it adjourned. The great difficulty, he said, was in harmonizing the conflicting opinions into concrete form in some one measure that would meet the approval of a majority of the members, and that he was confident that at last, after years of work, the Good Roads Association had devised a measure that would land safely on the statute books.

It is learned, so he stated, on good authority, that the highway commission bill as now offered as a substitute by the committee, would meet Governor Trammell's approval. The good roads people of the state should take new courage and stand by the house committee substitute as they no doubt will.

Mr. Stanford of Osceola and Mr. McKinly of Jackson, members of the house committee, are champions of the bill and have done good work.

Mr. Williams, who has always been a good roads enthusiast, and who, with many other citizens of the state, has labored untiringly and patriotically for the economic and intelligent construction of hard surfaced roads in Florida, is enthusiastic over the bright prospects for good roads legislation during the present session.

* * *

Illinois.

The Illinois Good Roads Association, composed of representatives of 91 organizations of the state, met last month at Springfield and endorsed the good roads bill presented to the legislature by the special commission appointed sometime ago to draft a road bill. The delegates spent several days in Springfield doing "missionary" work among the members of the 47th general assembly and very effective work was done.

A feature of the convention was a speech by Governor Dunne.

"I know the necessity for good roads in Illinois, because I have traveled all over the state campaigning," said the governor. "I am in favor of legislation which will give the state good roads and distribute the expense in an equitable manner.

"I believe our earth roads should be treated in a scientific manner and that the main roads should be improved so that our people can reach the markets without difficulty at all times of the year.

"I believe our highway conditions will be improved if we employ short-term prisoners on road work under an honor system as is done in Colorado, and I hope that before my term as governor is over we will see many miles of roads improved with this kind of labor.

"It will be good for the prisoners and good for the roads, and therefore good for the state. It can be done in such a manner as to take our convicts out of competition with free labor entirely."

The convention reaffirmed a platform which was

adopted at Peoria on September 27. One plank of the platform indorses convict labor on the roads and in the preparation of road material.

* * *

Idaho.

The new Idaho state highway commission held its first meeting at Boise, Idaho, on May 12 and organized. Following organization the commission at once got down to business and and three of its members left for northern Idaho to inspect the national highway link that traverses Shoshone, Bonner and Kootenai counties and confer with good roads enthusiasts of the north.

Theodore Turner, mayor of Pocatello, was elected chairman of the commission and Miles Cannon of Welter, vice chairman. Secretary of State Gifford is made secretary of the commission by the law. The three commissioners who left for the north were Turner, Gifford and Little. The commission decided to hold regular quarterly meetings the last Monday in March, June, September and December, as well as special meetings at the call of the chairman.

* * *

Michigan.

In Detroit, Michigan, Governor Ferris is being severely criticised for signing the Smith-Bricker bill, which recently became law, providing for a state tax on automobiles for good roads in lieu of all other taxes. The law will remove \$10,000,000 from Detroit's taxable values, and Detroit is up in arms. The board of supervisors of the city of Detroit will spend \$25,000, if necessary, to test the constitutionality of the act.

It is said that Wayne county, in which Detroit is located, will not spend another cent of the \$2,000,000 good roads bond issue, of which \$800,000 still remains unissued. Wayne county will not profit from the state's construction of trunk line roads for which the auto tax money is intended to be used as the county's roads are in fine condition. The bill compels Wayne county to contribute for the construction of good roads in other counties. County Assessor Nagel points out that with a high rate the elimination of \$10,000,000 worth of automobiles from the local tax rolls will inflict a considerable burden on the smaller taxpayers.

State Highway Commissioner Ely, of Michigan, has added two new engineers to his department in order to meet the growth in state road building induced throughout Michigan this spring as a result of the adoption of the county road system by eight counties.

Road making in Michigan during the approaching summer is expected to double the new road mileage of past years. The state highway department is preparing to receive a double amount of business. L. H. Neilson, formerly a United States engineer in the Philippines, and K. J. Sawyer of Menominee county, are the new members of the commissioner's engineering corps.

"We look for great development in road building this season," declared Ely. "In other years state engineers have not supervised the building of more than 450 miles of new road annually, but we look for double that mileage in 1913."

General adoption of the county road system, which has now been accepted by 54 counties, means the opening of a new era in state highway building in Michigan, according to Commissioner Ely. He expects state reward roads to be built henceforth at the rate of 1,000 or more miles per year.

The Alswede-McNitt Trunk Highway bill, mentioned briefly in Southern Good Roads last month, has now become law in Michigan, and the state highway com-

mission will begin one of the most strenuous campaigns for improved roads which this state has ever known. Under the new bill, the state allows an appropriation of \$500,000 for this purpose, and since the various counties pay half of the expense of constructing roads, \$1,000,000 will be spent for road building by the state department and localities throughout Michigan.

In every instance the system of trunk roads will be established that roads may be connected rather than having mere patches of improved highway scattered about the state. The main trunk road, which is practically completed across the lower part of the state, extending through Detroit from the eastern state line to the southwestern Indiana line, will be connected with various counties surrounding. From the north there will be built a road which will extend through Lansing to Mason, connecting with the Detroit road west of that city. Another road, which promises to prove one of the most popular in the state, is already partially completed, and extends along the lakes on the shores of Michigan completely around the lower peninsula.

There are now 54 counties under state aid system and practically all of these will have improved highways when the present bill, now on the governor's desk, has been signed. Two roads to Lansing will be constructed. One will extend from Webberville and the other from Leslie.

While roads not connecting with trunk lines will be constructed in some counties where the greatest need exists, those highways connecting with these main thoroughfares, will receive the greatest support from the state. While many of the macadam, gravel, and pike roads in the state are but nine feet wide, an attempt will be made to construct wider roads in the future. To encourage these wider highways, the state will pay 10 per cent additional where roads are built from nine to 15 feet in width.

* * *

Minnesota.

The three members of the Minnesota State Highway Commission have made a distribution as provided by law, of the \$350,000 road and bridge fund to the 86 counties of the state. They have completed the task with satisfaction to themselves and it will probably please the majority of the counties.

The average to each county would be \$4,070, but the commission based apportionment on population, assessed valuation, interest in good roads and other matters, and the result is that slices of the melon range from \$2,500 to \$10,000. Hennepin, Ramsey and St. Louis counties, in view of their large contributions to the general fund, were awarded \$10,000 each. Of the distinctly rural counties, Winona, a pioneer in advancing the good roads movement, was voted \$8,000 and Blue Earth \$7,000.

Beltrami and Koochiching counties were voted \$5,500 each because of their large area and the extent of state lands exempt from taxation, and Itasca was given \$6,500 for the same reason.

The fund is larger by \$10,000 than was distributed in 1912.

* * *

Missouri.

The Kansas City Star takes note of a legal tangle that is disturbing the good roads builders of Clay county no little. Two macadam roads running from North Kansas City to Liberty have been voted for and bonds issued, the roads to be constructed under the benefit assessment plan. The land-owners are perfectly willing but the point of law has been raised by eas-

tern bond buyers that, being issued under the act of 1905, which has been superseded by later acts, the bonds are not legal. The question of law has been argued before the Missouri supreme court and an early decision is looked for.

The Star notes, however, that the Kansas City-Liberty good roads are not dependent only on that decision. If the court rules against the old law, or if for any other reason the voted bonds cannot be sold, the districts will issue bonds under the new law passed by the late legislature. That new law has been approved by the lawyers for the bond buyers.

In all, there are five special benefit road districts already organized in Clay county, and petitions are being circulated for others. The five already existing are: The Kansas City-Liberty Boulevard Road District, the Ridge Road Boulevard District (also a Kansas City road), the Ruth Ewing District (for a road toward Independence,) the Sugar Tree Grove District (including a link in the Kansas City chain) and the Nashua District, in the western part of the county.

About fifty miles of rock roads are planned for these five districts. The two first named have voted, respectively \$77,000 and \$66,000 of bonds.

The Kansas City-Liberty Boulevard Road is known as the river route. The Ridge Road runs along the hills, practically paralleling the new Excelsior Springs trolley line. The "river route" district includes the first nine and one-half miles from Liberty toward Kansas City. Then there are two miles in the Sugar Tree Grove district to complete the rock road to the Armour-Swift line.

As showing the sentiment for good roads in that part of Clay county, when the land owners voted last June to build the road and to tax themselves they also voted their choice as among three plans submitted. One plan was for an oiled road to cost \$50,000; one for a rock road to cost \$60,000, and the third for a rock road with a tar binding to cost \$70,000. All except two of the farmers voted for the best and most expensive road.

* * *

Ohio.

Five million dollars a year for market roads—that's what Ohio proposes to spend.

Few, perhaps, other than James R. Marker, state highway commissioner, have a correct conception of what this vast amount of money, expended in repair of old and the construction of new roads, actually will do toward placing the Buckeye state in the front rank of market roads states. Mr. Marker himself is not able yet to make a complete statement.

Under the provision of the Hite road law, providing for half a mill levy on the grand tax duplicate of the state, approximately \$3,500,000 will be raised. One-fourth of this amount, \$800,000, goes directly to the state to be expended in construction of a system of main market roads. The remaining three-fourths, \$2,400,000, will be distributed equally among the 88 counties. Each county thus will receive about \$30,000.

In order to have a say in the manner in which this \$30,000 will be expended, the county must raise an equal amount. Mr. Marker figures that many of the poorer counties will not be able to raise \$30,000. However, he contemplates that three-fourth of the counties will respond. This would raise an additional \$1,600,000. In addition, the income from the automobile tax will add about \$200,000, raising the grand total to \$5,000,000.

None of this money will be available until the first of 1914. The first installment will be collected in December, but county officials will not make their settle-

ment with the state until the first of the year.

But Mr. Marker will not wait until the money is in the state treasury to begin. As far as possible, he will have the roads selected which are to be reconstructed and all necessary surveys made. He is of the opinion that he will be able to let many of the contracts, even before the money is in the treasury, so construction can be begun as soon as weather conditions permit.

His first plan is to build connecting links, uniting sections of good roads which now are separated by almost impassable stretches. This, he figures, can be done during the first year. Thus, the end of the first year will find Ohio with a tolerably fair system of connected highways. Work thereafter will be in rehabilitating and in constructing entirely new highways.

* * *

Tennessee.

Despite the turbulence of Tennessee politics a great deal of progressive road legislation managed to get on the statute books of the Volunteer State during the session of the legislature just closed. Mr. C. C. Gilbert, of Nashville, secretary of the Bristol-Memphis Highway Association, has the following to say about it:

"I am sorry that more progressive legislation was not enacted; at the same time, I do not think the cause of good roads suffered any during this session. It was found early in the session that a general good roads bill was not practical for the reason that each representative was anxious to get through some pet measure of especial interest to his county, and was not willing to support a general bill. However, enough general bills were passed to enable the counties in the state to make rapid strides, if desired, in building roads.

"Many of us were disappointed that the bill creating the highway department was deferred so late in the session, but this action was taken by the good roads committee for the reason that it was thought best to get all of the information available and incorporate same into one bill. When the break came in the legislature and the alignment changed, it was found necessary to almost completely change the bill before it could be passed. Neither Mr. Johnson, chairman of the good roads committee, nor myself was entirely satisfied with the present bill, but we thought it was a start in the right direction, and if it could become a law then the commission could work out a new one or propose changes in this one before the legislature met again. Some of the reasons assigned by Governor Hooper in his veto of this bill were well founded; at the same time we were a little disappointed that he could not approve it and let it become a law.

"Another bill which was passed was one authorizing county courts to call an election for the purpose of voting on bond issues for road and bridge construction and maintenance. This is a general enabling act and will prevent a special act each time a county wants to vote bonds. Under the provisions of this act, at any session of the county courts an election can be ordered and the people say whether they desire an issuance of bonds for the building of roads, the building of bridges or for the maintenance of either. In the future this will obviate the necessity of passing a large number of local road bond bills.

"Another good bill passed at this session was the one creating road districts and enabling the people in that particular district to vote bonds for road purposes. These districts are limited to an area not exceeding twelve miles square, and can take in sections of more than one county, if desired. There are times when certain sections of a county desire to improve the roads.

but when a vote is left to the entire county there are sections which will vote almost solidly against the proposition. Under the provision of this road district act those sections which are indifferent to the cause of road improvement can be left to mud roads, and the remainder of the county can progress by issuing bonds and building roads. There are a number of counties in Tennessee which have more than once voted down a bond issue for roads which can now lay out certain sections of the county into districts and hold elections for road purposes.

"In addition to the general enabling acts passed, a number of local bond issue bills were passed. The reason for this was that in certain counties the only way wherein an election could carry for road purposes was that every provision be set out fully in the enabling act. For instance, the commissioners were named in the act, the number of miles of road to be built, the direction they were to take, how the bonds were to be issued, sold, etc. Of course in cases like this it required a special enabling act.

"After a number of members left the city for parts unknown, I went through the index and picked out most of the bills which had been recommended for passage and during the last few days of the session had a number of them called up and passed. The last day of the session I picked out seven good roads bills, gave different members the number of the bill and when local bills were called for, these members called up the other fellow's bill and in that way much good roads legislation, which would otherwise been left on the table, was enacted."

* * *

Utah.

The Commercial Club of Salt Lake City, Utah, has endorsed the proposition of its good roads committee for an issuance of bonds for \$1,000,000 for a system of good roads in Salt Lake county. The proposition will be brought before the county commissioners and by them submitted to the people.

The committee reports that investigation shows that last year the county spent \$127,029.96 on roads and bridges and that soon the annual expenditure will reach \$150,000. With a view to economizing, the committee urges the bond issue in order that permanent improvement work may be done. The committee declares that without increasing the annual expenditure the interest on the bonds can be paid, a sinking fund created that will redeem the bonds in twenty years, provision made for the maintenance of roads and bridges and that a practical system of road building can be inaugurated.

* * *

Virginia.

Mr. Lester C. Busch, Secretary, of the Bristol, Va.-Tenn. Board of Trade writes Southern Good Roads as follows:

That there is but eighteen miles in short links still to build in order to complete the Bristol to Bluefield, W. Va., highway was brought out at a meeting of the officers of the association, Hon. Henry S. Bowen, of Written's Mills, Va., L. C. Busch of the Bristol Board of Trade, and supervisors of Russell county, Virginia.

The purpose of the joint meeting was to devise ways and means whereby the short links in this highway, which will be forty-eight miles in length when completed, may be built. Russell county has come to the front in the project and meetings were held at Tumbez, Belfast and Lebanon, Va., the latter part of May to give the people of the

Moccasin, Lebanon and Elk Garden districts an opportunity to say whether they will build the connecting links in Russell county by district bond issues or not.

Washington County, Va., still has about five miles to build from Greendale to the Russell county line through Moccasin Gap, and when this is completed the worst part of the 18 miles of unfinished roadway will have been done away with. The other links are comparatively short and fairly good country roads. Washington county officials will meet soon with officers of the Bristol Board of Trade to determine what immediate action can be taken looking toward the building of the Washington county link.

* * *

Washington.

The State of Washington has made wonderful progress in road building and it is because that state has enacted the best highway legislation of any state in the union. State Highway Commissioner W. J. Roberts recently made the statement that his state leads the nation in modern, up-to-date highway laws and he does not fear successful contradiction. The last legislature, which has just closed, greatly increased their efficiency. Mr. Roberts declared that the permanent highway law, by which the state and the counties build utility roads throughout agricultural districts of the counties, and the public highway law by which the state alone builds connecting lines between the separated county districts and sections of the state, were eminently satisfactory bases upon which to construct a system of excellent roads.

The present legislature appropriated approximately \$5,000,000 for road purposes, and Commissioner Roberts anticipates much good road development during the biennium.

A study of the history of the growth and development of civilization reveals the fact that absolutism and tyranny flourished just as long as the various scattered units of the people could be kept in ignorance of their common strength and that with the advance of education and enlightenment, tyrants and dictators lost their power. Probably the greatest factor in bringing this about was the building of roads enabling people to get together and work for the common good.

As roads were built, and various communities were brought into contact with each other, absolutism in government began to disappear from Christendom and the "consent of the governed" began to be a factor. Fifty years of road building in France, from 1740 to 1790, when the several Louises built 15,500 miles of military highways, brought the people of the French provinces into such close touch with each other that the French Revolution became possible. When Napoleon later extended and perfected the system he dug the grave of monarchy in France, and made its government "of the people, by the people, for the people." So today France stands first of all the nations of the earth in the wealth per capita of its people and in the general distribution of the land. There are few if any great fortunes in France, as fortunes are counted on this side of the Atlantic, but there is very little poverty. Everybody has enough and there is peace and content in the land.

Meridian, Mississippi, which is situated in Best No. 1, Lauderdale county, has available now \$180,000 for extending and improving streets to connect with the fine road system of the county.

GOOD ROADS NOTES IN BRIEF

Precinct No. 1, Bell county, Texas, has voted bonds for \$150,000 for constructing roads.

Kerr county, Texas, has voted bonds for \$40,000 for road work.

Lindale district, Smith county, Texas, has voted \$75,000 of bonds for road work.

Old Fort Township, McDowell county, North Carolina, has voted bonds for \$20,000 and is making a bid for \$10,000 supplemental from the federal government for work on the Central Highway.

The city of Houston, Texas, one of the most progressive towns in the south, continues to build streets and plan for bigger things. An election is to be held on July 1 for a bond issue of \$800,000 for streets.

On June 24 St. Landry parish, Louisiana, will vote on a \$500,000 bond issue for road construction.

Stafford county, Virginia, has contracted for 17½ miles of macadam road at a cost of approximately \$40,000.

The city of Baltimore, notes the Manufacturers' Record, now has the tremendous sum of \$14,000,000 available for street work.

From Meridian, Mississippi, comes the report that the Good Roads Commission is asking for bids on 30 miles of roads.

Dickson county, Tennessee, joins the ranks of the progressives with a bond issue of \$250,000 for road construction.

Greene county, Tennessee, voted bonds for \$500,000 last month for building roads.

Warren county, Tennessee, voted \$110,000 to improve 75 miles of roads already built and extend present roads to the county lines.

The commissioners of Tarrant county, Texas, have let contracts for a complete system of roads for the county to cost \$709,214.76.

Third ward, of East Baton Rouge Parish, Louisiana, has joined the ranks of the progressive communities of that section and voted a bond issue of \$68,000.

New Hanover county, North Carolina, has voted bonds for \$100,000 for the extension of that county's already fine system of roads.

Davie county, North Carolina, one of the state's smallest and weakest counties, voted a bond issue of \$175,000 on May 31. The majority in favor of the bonds was more than 600 and every township in the county gave a majority in favor of it.

McDowell county, North Carolina, is wide-awake on the road proposition. Last month Nebo township voted bonds for \$10,000 for road-building and other townships have already voted bonds.

Hidalgo county, Texas, votes this month on a bond issue of \$200,000 for road-building. The election is set for the 18th.

On July 29th, Farmville township, of Pitt county, North Carolina, will vote on \$40,000 of bonds for road-building.

In Davidson county, North Carolina, the county that turned down a \$300,000 bond issue in April, good roads sentiment continues to grow slowly. Arcadia township voted a special tax for roads last month by a small majority and Emmons township will vote on a special tax July 1.

Rocky Station and Rose Hill districts, of Lee county, Virginia, vote June 24th on bond issues of \$60,000 and \$16,000 respectively for good roads.

There will be an election in Beat 2, Jones county,

Mississippi, on June 19th to vote on a bond issue of \$50,000 for road construction.

Smith county, Texas, according to a dispatch from Tyler, will hold an election on July 8 to decide on a bond issue of \$200,000 for roads.

The city of Corpus Christi, Texas, has recently contracted for street paving to cost \$600,000.

Gastonia, North Carolina, will construct 38,000 square yards of sidewalks.

In Jackson county, North Carolina, Cullowhee township has available for road work \$20,000, the proceeds of a bond issue voted recently.

The Louisiana state board of engineers will grade and resurface 14 miles of road in the region of Baton Rouge.

Beat 1, LaFayette county, Mississippi, will construct 40 miles of roads.

From Webster, North Carolina, comes the news that Sylvia township will construct good roads with the proceeds of a \$50,000 bond issue recently voted and sold.

Orange, Texas, will spend \$20,000 recently voted by the people, in paving streets.

Tuscaloosa, Alabama, will pave Greensboro avenue and Broad street at a cost of about \$90,000.

The city of Abilene, Texas, has contracted for 75,000 square yards of asphalt macadam paving.

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BRIDGES & CULVERTS

Mobile county, Alabama, has contracted for a number of steel bridges and culverts on the Halls Mill road. Hopkins county, Kentucky, will contract this month for half a dozen bridges.

Cabarrus county, North Carolina, has contracted for a bridge across Rocky River.

Lenoir county, North Carolina, will open bids July 7 for a steel bridge to cost about \$8,000.

Haskell county, Oklahoma, will hold an election to vote on a bond issue sufficient to build a system of permanent bridges and culverts throughout the county.

Davidson county, Tennessee, has contracted for the building of a viaduct 560 feet long, to cost \$27,000.

Plans are being laid for the construction of a reinforced concrete bridge across the James River, connecting Richmond, Virginia, with South Richmond. The proposed bridge will have 11 arches and will cost \$600,000. Plans for it have been drawn and are now under consideration.

The county commissioners of Morgan county, Georgia, are contemplating the erection of a bridge across the Appalachian river, between Greene and Morgan counties. It will be 452 feet long and have a 12-foot road-way.

Clarke county, Mississippi, is preparing to bridge the Chickasahay river near De Sota.

The construction of a steel bridge over the Neuse river at Goldsboro, North Carolina, is being contemplated.

The commissioners of Lenoir county, North Carolina, contemplate bridging the Neuse river at two points at an estimated expenditure of \$200,000.

The city of Houston, Texas, will vote July 1 on a bond issue of \$400,000 for bridge and culvert work.

The commissioners of Nacogdoches and Angelina counties, Texas, will build a bridge across Angelina river, 125 feet in length with 2,300 feet of approaches.

Elmore county, Alabama, may build a bridge across Tallapoosa river at Ware's Ferry. Estimated cost, \$24,000.

Bids will be asked until June 24th for a reinforced concrete bridge across Rock Creek, District of Columbia, connecting Georgetown and Washington. The bridge work, ornamentation of approaches, etc., will cost all told about \$300,000.

Tarrant county, Texas, will spend \$54,000 to build a bridge across Trinity river.

The commissioners of Mecklenburg county, North Carolina, will build a 200-foot bridge across Paw creek.

Tarrant county, Texas, has been asking for bids on a number of concrete bridges.

The commissioners of Wake county, North Carolina, will build two bridges, one across Swift creek and the other across Neuse river.

Sussex county, Virginia, is asking for bids on seven bridges.

In Santa Rosas county, Florida, a bond issue for the construction of a bridge across the Escambia river was defeated.

The city of Augusta, Georgia, has contracted for the construction of two important bridges, one to cost \$15,450 and the other \$3,200.

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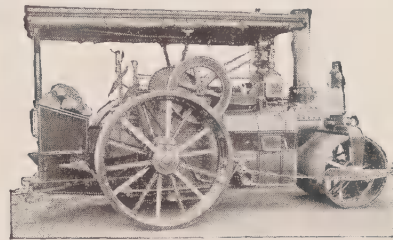
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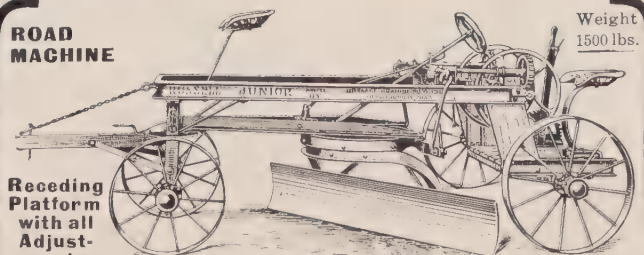
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SEPT. 29-OCT. 4.**

The American Road Congress will hold its third annual meeting at Detroit during the week of September 29. This decision was reached by the joint committee of which Logan Waller Page, Director of the United States Office of Public Roads, is chairman, after a spirited contest which finally narrowed down to the cities of St. Louis, Denver, Minneapolis and Detroit. The congress is the great annual assemblage of the good roads organizations throughout the United States and is held under the auspices of the American Highway Association, the American Automobile Association and the National Association of Road Machinery and Material Manufacturers, the latter organization being concerned primarily with the exposition of machinery and materials, held in conjunction with the congress.

As there are between thirty and forty state and interstate organizations identified with the American Highway Association in addition to its 1800 regular members, the big meeting will be thoroughly representative in character.

The officers of the congress are Logan Waller Page, Director of the United States Office of Public Roads President; Lee McClung Treasurer; J. E. Pennybacker, Secretary.

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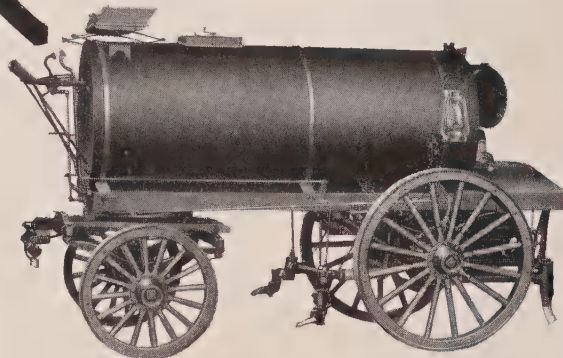
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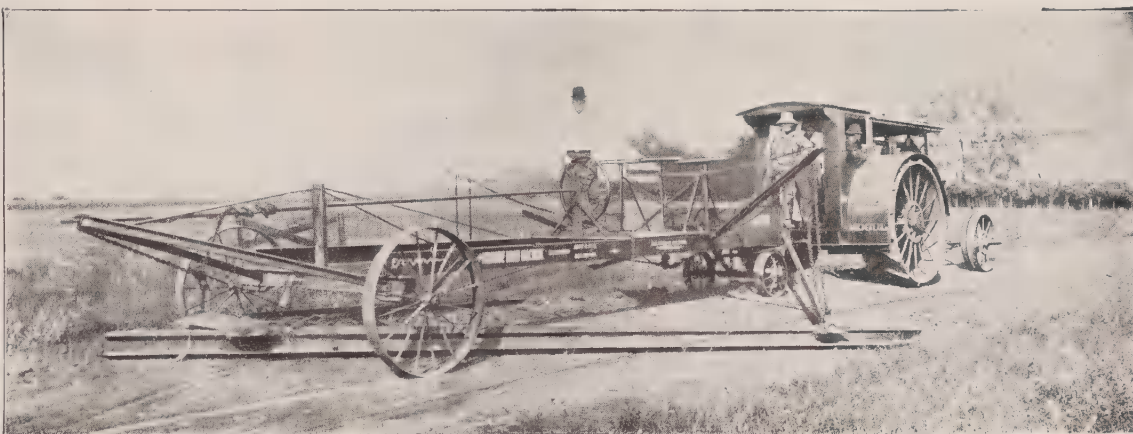
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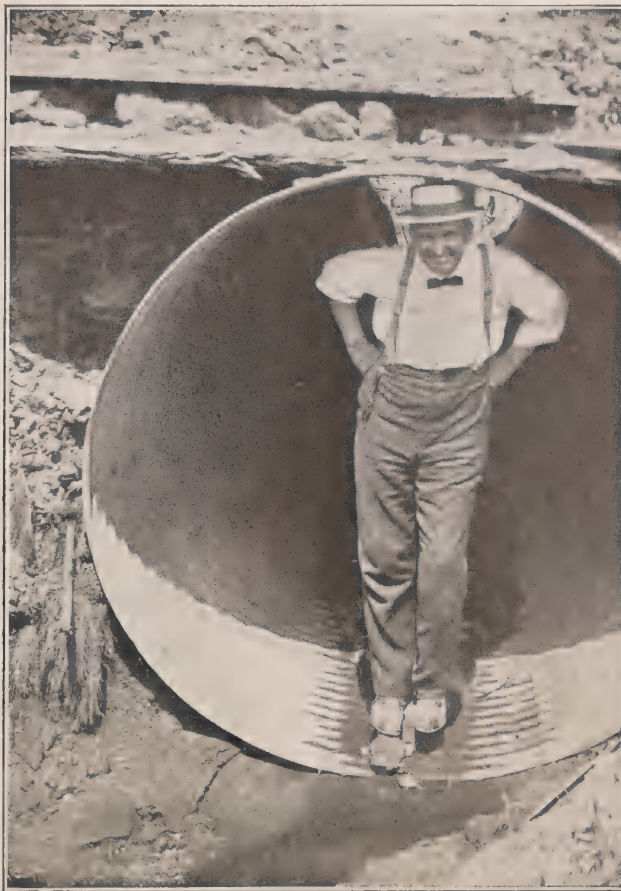
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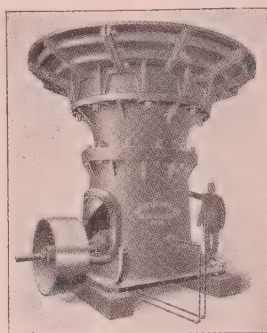
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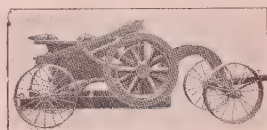
Rollers
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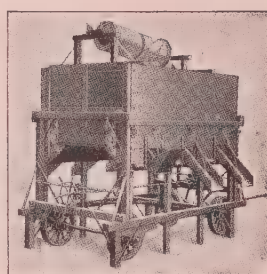
Rock Crushers
Stone Screens
Stone Bins
Wheelbarrows



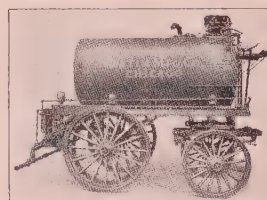
Austin Gyratory Crusher



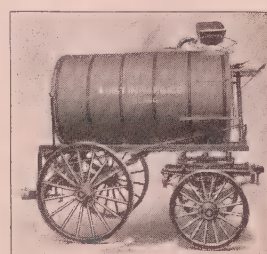
Aurora Rock Crusher



Aurora Bins and Screens



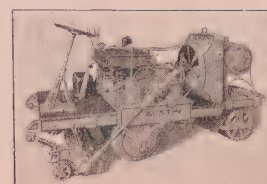
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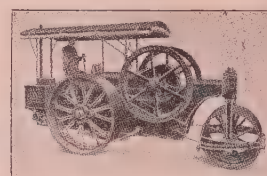
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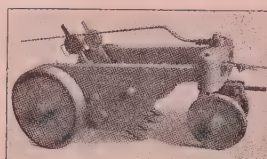
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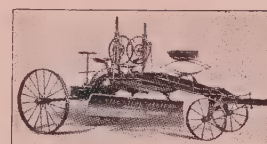
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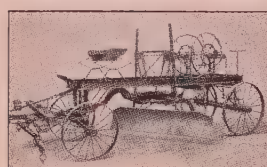
Austin Motor Roller



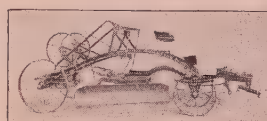
Austin Scarifier



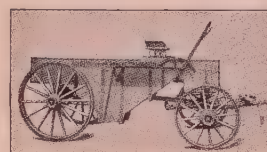
Little Western Grader



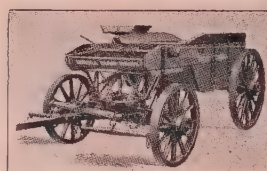
Western Grader



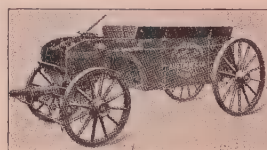
Austin Grader



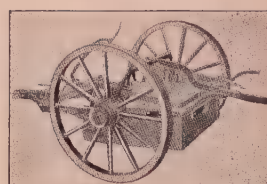
Austin Stone Spreader



Aurora Dump Wagon



Austin Dump Wagon

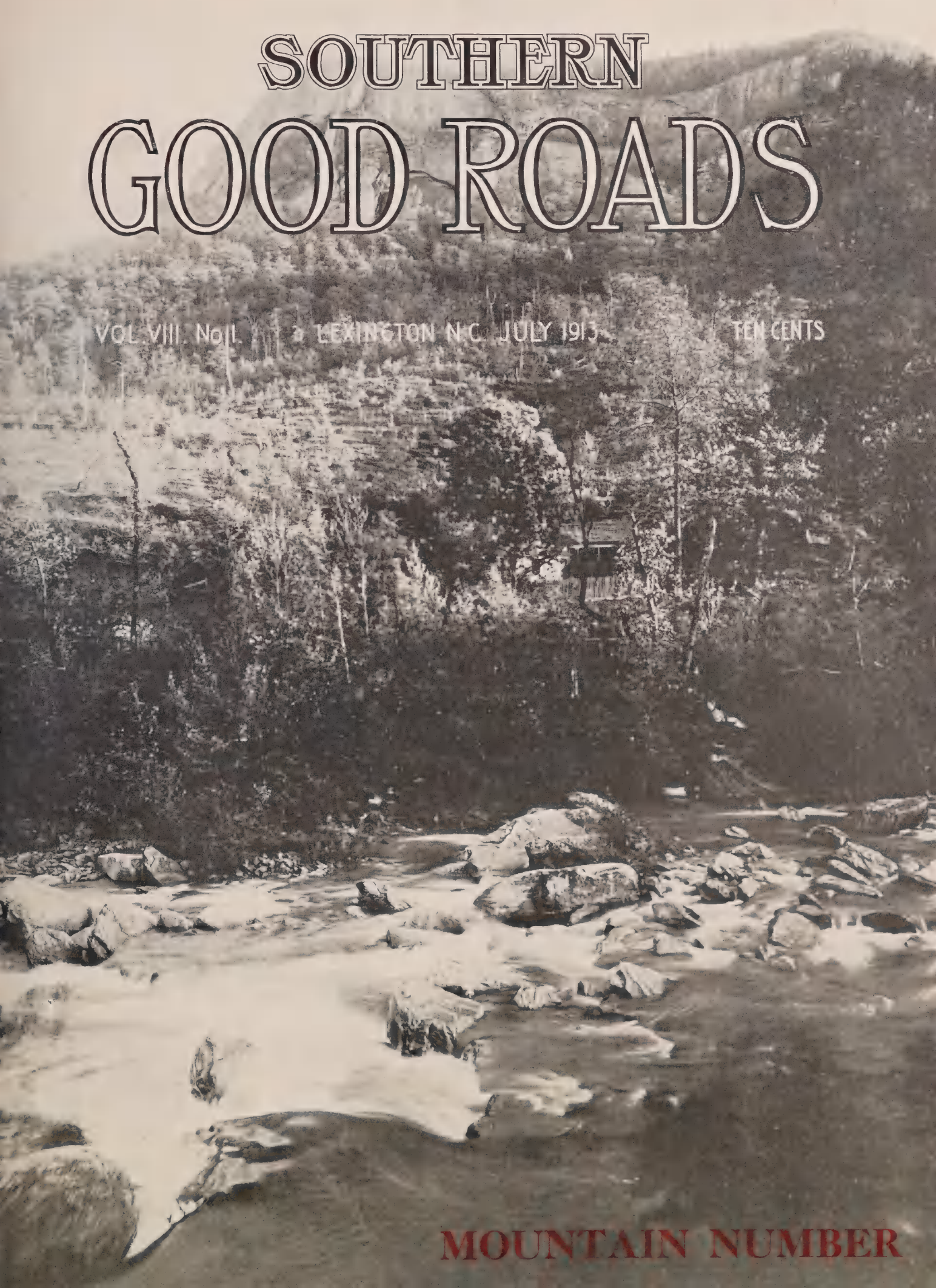


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the large voids of new construction; "Tarvia A" is of thinner consistency for surfacing operations; "Tarvia B" is used cold, can be applied from a sprinkling cart and is sufficiently limpid to percolate into the pores of an old and well compacted road.

"Tarvia X" is required where new construction is called for. "Tarvia A" and "Tarvia B" are used in improving and protecting roads already in use.

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SOUTHERN GOOD ROADS

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Lexington, N. C., July, 1913

Entered at Lexington Post Office as
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Tramping it Through the Mountains of Western North Carolina

By COL. FRED A. OLDS, Raleigh, N. C.

WHEN WE talk of good roads we think nowadays of King Gasoline, his speed, and his odor and of the highbrows who all too often sit aloft in the machine and smile superior at people in other vehicles and who of course could not afford to look at a poor plodder like the writer of this sketchlet, who thanks God for a pair of feet and legs and for ability to walk upon them.

After all, my lords and gentlemen, it is your walker who sees things. He is not a highbrow, but is lowly and content, and though by choice he takes a mountain trail he thinks alway of the scenery, the people and the country in general, what he is going to get to eat and where he will lay himself down for the night, and he is an object of very tender regard in the high mountain country which is the only place where one really lives and walks and walks and lives during the

ing anywhere and everywhere at a minimum of expense and trouble, with no punctured tires or shortage of gasoline. Then, too, the walker, after a climb, is rewarded by such a view of the world that he feels himself a first discoverer of the prospect before him, and claim brotherhood with Christopher Columbus, who



"As a mountain, Grandfather is vastly more humanly interesting than Mt. Mitchell." The picture shows Grandfather's "Attic Window"



"What visions come to the mind of that mountain region; of the beautiful swing bridges, made of wires and boards, over translucent streams

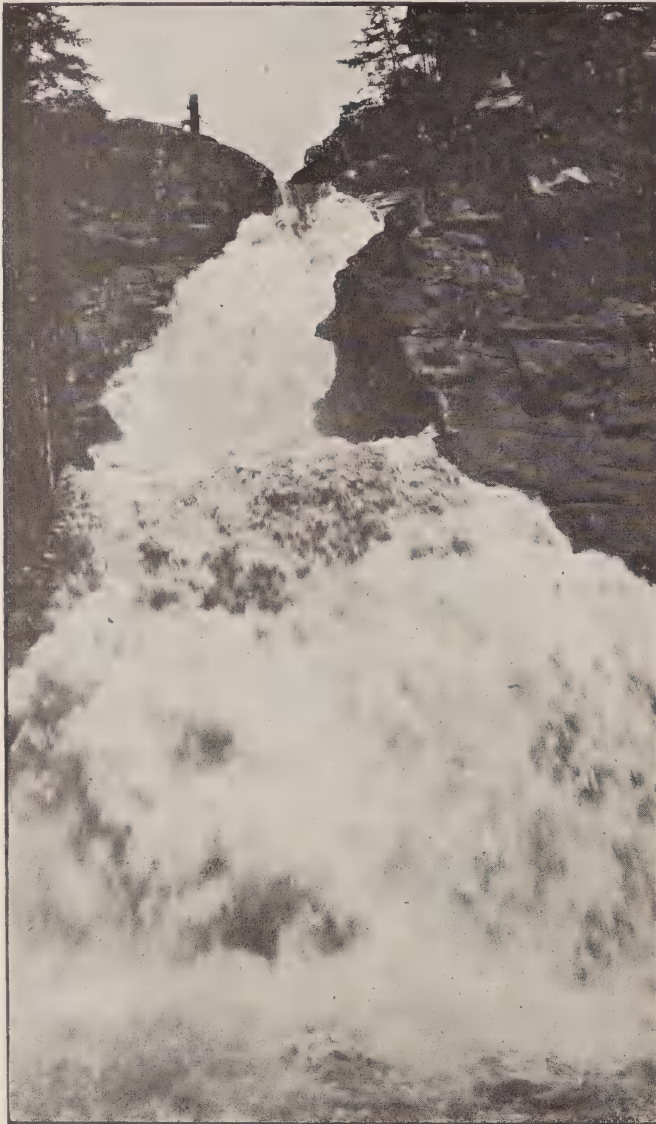
glad season between the end of May and beginning of October. I have tramped over many a glad mile in our mountain country and the essence of the charm of it is the variety of things one sees, the opportunity of go-

had he lived on this side of the water would surely have been called "Kit" for short.

The mountain world, the real thing, begins, one may say, at Roaring Gap, and comes around like a fish-hook, ending not very far from Hickory Nut Gap, and the writer has been all around the shank and the hook and the point. There are in that curve some of the most surprising bits of scenery in America. It must not be thought that the trumper, the gentleman tramp, let us say, who pays his way when the good folk will allow him to pay, does not appreciate a good road, for he does, and often in his dreams there come to him memories or visions of bits of the beautiful Yonahlossee turnpike, the graceful road from Boone to Blowing Rock, the splendid highways in Haywood and in Buncombe, and, strange to say, here and there in some of the counties which are very seldom visited stretches of really lovely road, nay, almost natural.

If one desires a suggestion as to a route to take, the writer would recommend that from Roaring Gap by way of Sparta, Whitehead, Laurel Springs, Jefferson,

Creston, Boone, Blowing Rock, the Yonahlossee, Linville City, Linville Falls, thence up to Cranberry and Roan Mountain, and across Mitchell and Yancey counties, over Black Mountain to Asheville, and thence over Pisgah and the Pink Beds to the southward. There will not be a dull moment in this walk, and all



"There is Linville Falls, coming down from a plateau and through the stately white pine forests---with its wonderful gorge or canyon, where one sits 1,000 feet high above the stream and looks in the face of three beautiful peaks, Hawk's Bill, Table Rock and Palace of the Gods"

the way from Roaring Gap to Linville Falls and a little beyond tourists are about as scarce as snowballs in July. One result of this is that the natives, like the primitive Indians, are unspoiled. It was the great American tourist who spoiled the Noble Red Man, and now that the latter has been made a negligible quantity, the tourist camps down in shoals upon good people, raises prices and sometimes Cain at the same time, and is all too frequently a demoralizer.

Therefore the heart and the mind of the writer long for such dear stretches as Alleghany, Ashe and Watauga counties, where, barring Blowing Rock, the tourist is so few that he does not have to be reckoned with. But John A. Mills, of Raleigh, is building a road into Alleghany and soon the bloom will be off that grape, and a company is hacking at the Blue Ridge at

another part of its great wall to get into Watauga.

What visions come to the mind of that mountain region; of the beautiful swing bridges, made of wires and boards, across the translucent streams; of the people one meets on the isolated roads, such as the two men with a bull and a tiny wagon with wooden wheels and a pull-back strap, manipulated by one man, to keep the vehicle from running against the bull's hind legs; in the wagon being blood-red peaches at ten cents a bushel! Then there is the cabin on a wild road in Ashe county, and the gentle youth of seventeen years, with his hair banged like a girl's, who faced the camera while the nine other members of his family dashed back into the house, he saying, "What air you-all agwine ter do with that mershine? Will it hurt me or my folks?" We "snapped" him and moved on, leaving a grin on his face as wide as the cut of his bangs.

And then there is, away up at the point where Burke and Avery and Mitchell counties come together, nigh Linville Falls, the "marrying tree," with a ring in the ground around the big white oak, made by the hoofs of many a horse. Up dash a couple, riding hot-foot, maybe with father on the chase. On one little knob in sight of the tree is a preacher and on another a



"What visions---of the people one meets on the isolated roads, such as the two men with a bull and a tiny wagon with wooden wheels and a pull-back strap, manipulated by one man, to keep the wagon from running against the bull's hind legs

magistrate, and these sleep with one eye and both ears, open, and if they hear any hoof-beats they are out "to do the marrying." As a net result each has a very cozy little place. In that part of the country it doesn't cost much to live, \$8 a month "with everything flung in," being the country rule.

Warm-hearted, impulsive, frank people are the sort the writer has always found in the North Carolina

mountains; hospitable and just as home-folksy as any heart could wish. They are very proud of that dear and very primitive world of theirs, though a lot of people in the world outside think they are so smart that they must needs sneer at these good mountain folk. They can save their sneers for themselves.

It is a high world where this walker goes, sometimes all day 4,000 feet above sea level, and he will when he tops Mount Mitchell, rejoice that he is up 6,888 feet. He is enthusiast enough to be glad to take a look at the Crest of the Blue Ridge Highway and to take off



"The 'Marrying Tree' with a ring in ground---made by the hoofs of many a horse." Colonel Olds in characteristic pose under this famous white oak

his hat to Pratt, Varner and the rest of the apostles of Good Roads, even though he feels in his heart that these are going to open the country which he almost wishes could be kept inviolate; but that would be too selfish, really.

There is Linville Falls, coming down from a plateau and through the stately white pine forests and being the only stream to cut its way through the Blue Ridge and go into the Atlantic ocean; with its wonderful gorge or canyon, where one sits 1,000 feet high above the stream and looks in the face three beautiful peaks, Hawk's Bill, Table Rock and the Palace of the Gods.

The memories come of quaint Spartatown, of Jeffer-

son, and of Boone, at the latter being the courthouse highest above sea level except that at Denver, Colorado.

As a mountain Grandfather is vastly more humanly interesting than Mount Mitchell, giving a finer prospect and far more variety, and its three peaks are something worth striving for.

On three tramps the writer made his way into the Cherokee Indian country, where 2,000 Red Men have their 90,000 acres of land in common and a good high school, and several grammar schools and one of the pictures shows four of us down-country folk with our Cherokee friends. We dress in the simplest way in the world, the equipment consisting of a cap, a khaki shirt, khaki trousers and walking shoes, not too stout or too high, and leggings if the weather be bad.



A Group of Cherokee Girls

Across the shoulder a pack is carried, tied in a loop, the cover of this being white oilcloth a yard wide and two yards long. In this are laid and rolled an extra shirt and trousers, rain coat, socks, and various toilet articles; everything being reduced to a minimum, and 16 pounds' weight will embrace all. Such a pack never chafes, causes very little perspiration, does not stain the clothing, and can be easily shifted.

It is no trouble to walk twenty miles a day, and upon a pinch ten more can be added. One of the photographs shows a group of Cherokee girls, walking on the track of the little railway which connects their "capital" with Ela, a station on the Southern railway. This Indian country is known to but few people, and yet North Carolinians can get there at a ball game, where lacrosse or Indian ball is played and at the incantation the night before, about as many thrills as they would at a Mexican bull fight.

To the writer all these sights and scenes are like an open book, and they will live in memory as long as it shall last. Know thy North Carolina first, gentle reader, and if thou be a man with good red blood in you and the proper amount of bones to support you, take

up, not exactly thy bed, but thy pack, and walk. You will find a plenty for three months' tramping, and then you can go anywhere in this country, crow about old North Carolina, and prove what you say, for this state, to use the slang of the day, "has the goods."

The Good Roads Subject in Congress.

"Congress has the power to extend national aid to good roads under the inter-state commerce clause of the constitution, and the authority to build military highways and to establish post roads. Jefferson thought so, Madison thought so, and so did Calhoun. There is no question about the power of congress in the premises."

So asserted Chairman Henry of the Rules Committee of the House of Representatives recently when he concluded the debate which preceded action that created a committee on public roads—the first time in the existence of congress that the roads question received a recognition which places it among the big subjects now demanding positive national legislative attention.

It will be remembered that the March Federal Aid roads convention in Washington called by the American Automobile Association, through its resolutions committee asked congress to create a committee to which all roads matters would be referred. Congressman Slemple of Virginia was the author of a speech wherein the convention was urged to ask congress for the committee that has just been named.

Twenty-one members have been selected to constitute this committee, with Representative Shackleford of Missouri as chairman and the others in the list as follows: Edward W. Saunders, Virginia; Henry A. Barnhart, Indiana; James S. Davenport, Oklahoma;

James F. Byrnes, South Carolina; Hubert D. Stephens, Mississippi; John J. Whitacre, Ohio; Robert L. Doughton, North Carolina; John R. Connelly, Kansas; Edward Keating, Colorado; Clyde H. Tavenner, Illinois; Peter G. Ten Eyck, New York; James B. Aswell, Louisiana; Frank L. Dershem, Pennsylvania; C. Bascom Slemple, Virginia; S. F. Prouty, Iowa; Thomas B. Dunn, New York; Howard Sutherland, West Virginia; Milton W. Shreve, Pennsylvania; Edward E. Browns, Wisconsin; Roy O. Woodruff, Michigan.

Of the twenty-one, fifteen are new members of the house. The remaining six have given highways matters some considerable thought, Chairman Shackleford probably leading in his activities. Byrnes of South Carolina, Slemple of Virginia, and Prouty of Iowa are well-known advocates of federal participation, while Saunders, another Virginian, and Whitacre of Ohio, have evidenced interest in the subject. New York has two members on the committee—Ten Eyck and Dunn; Pennsylvania is similarly favored—Dershem and Shreve. Politically there are 14 democrats, 6 republicans, and 1 progressive, the last being the Michigan representative.

That the good roads subject "has arrived in congress," there can be no doubt. It was only a year ago that one of the then senators from Oregon—Jonathar P. Bourne—told his colleagues that the "good roads question was of far greater importance than the pending tariff and currency questions combined." The Joint Committee on Federal Aid, of which Mr. Bourne is the chairman until it completes its report, has accumulated a vast amount of valuable information which is now obtainable in printed form upon application at Room 130, Senate office building, Washington, D. C.



Beautiful macadam road in Tazewell county, Virginia. This photograph was sent in by Mr. A. M. Black, of Tazewell, Va., and wins the first prize of \$2.50 offered for the best photograph of a good road for the month of July

Lights and Shadows in "God's Country"

By A. L. FLETCHER, Lexington, N. C.

I WENT back to the mountains last summer, back to the land where I was born and where my people before me, many generations of them, had lived and died. I had been away many years. Newspaper and magazine work does not permit one to wander far afield and my long unbroken sojourn in the lowlands had not been of my own choosing. My heart had been there, many a time, but my work did not permit of vacations. Rarely was there a dewey summer morning that I did not hear in fancy the staccato bark of the gray squirrel on the rugged sides of the "Paddy" or over on the "Nigger" to the east of my old home, and rarely a drowsy summer evening when I did not dream, just a few seconds, of the soul-stirring leap of the speckled trout as he cleared the water and took my grasshopper along the banks of Beaver Creek or Little Buffalo, under the lengthening shadows of the grand old mountains of Ashe. Last summer, in the middle of August, I broke away from my work and went back home.

Since I left the mountains work has been started on a railroad from the little town of Elkin, in Surry county, to Sparta, Alleghany county. The road had been completed to Thurmond last summer, a little village huddled at the base of the Blue Ridge. As you leave the train at Thurmond the great blue mountain looms up before you like an impassable, insurmountable wall. It does not appear to be more than a mile away from you. In reality, it is three miles to the foot of it. In all its unbroken, wooded height you can't find the trace of a road. The only mark of civilization on the entire face of that great, towering mountain is Roaring Gap Hotel, perched like a little white martin box at the very apex of the mountain. The man who can look upon that great, forest-clad expanse of mountain without a thrill and an all-pervading sense of the greatness of the God who created it, is not much of a man.

There was a hack at Thurmond waiting for me and I was soon on my way. The road was picturesque but that is all. To really enjoy travelling in the mountains of North Carolina and Virginia, you must foot it. There are no really good roads, except in a very few counties, but to one who was born there and who grew up accustomed to following bridle paths through well-nigh trackless forests and bumping over rough and stony roads in rough vehicles, the mountain road soon loses its terror, even though he has long been away from it. I forgot the road in the sheer joy of living once more in God's own country.

We reached the foot of the Blue Ridge in half an hour following close along the right of way of the railroad. Capt. Walter Williamson and his little band of convicts, about fifty or sixty all told, were driving straight into the face of that mighty wall of forest and granite, a pitifully small force, I thought, to be bucking such tremendous obstacles. I asked Mr. Williamson when he thought they would get to Sparta with the line. He looked up at the Blue Ridge rising over him, smiled, and said: "We will run an engine into Sparta in the summer of 1916, with our present force. Earlier if we can get the men and the equipment."

Two big steam shovels were at work on the line. Now, I have a high respect for the steam shovel and watching it at work in the lowlands, I have thought it a mighty piece of machinery. Up there, outlined

against the Blue Ridge, those two steam shovels looked like toys, totally inadequate for the task that confronted them.

From the foot of the Ridge to Roaring Gap Hotel, it is seven miles. The grade is not bad at any point, though the road is rough and rocky a large part of the way. I was surprised to see automobile tracks and the driver told me that many autos from Elkin and other points had gone as far as the hotel on the top of the mountain, though few had ventured farther. Seen from the road, the mountain-sides are not all forest-covered. Here and there along the road are log cabins. Some are high above the road, clinging to the side of the mountain. Others are far down in ravines. I remember one that seemed to be almost directly underneath me as I leaned out of the hack and looked down at it.

It took all of three hours to climb the mountain, but what a view there was spread out beneath when the summit was reached. My driver, a native mountaineer, impatiently urged me to keep moving but it was hard to tear myself away from it. Before us and beneath us lay Surry county, with Pilot Mountain stand-



"There was the wide shallow ford at Mouth of Wilson, where New River, to my childish eyes, was a mile wide." This is near the Carolina-Virginia line

ing out alone to the east, Wilkes, Yadkin, Stokes and Forsyth. Turning to the north, an unbroken succession of mountain ranges met our gaze, none of them much lower than the Blue Ridge. There was no descent to be made for practically all of Ashe and Alleghany counties, as well as Grayson county, Virginia, are on a level with the summit of the Blue Ridge.

The days that followed will be bright in my memory forever. Sparta, the county seat of Alleghany, Jefferson, the capital of Ashe, with its triple row of cherry trees down Main street, were the same delightful, sleepy little villages that they were when I left them a decade ago. I climbed the "Nigger" mountain against whose northern base Jefferson is built and looked down upon it as I had in the days of my boyhood and saw no change in it, except that there is a new court house in the place of the old. It is a great little town and its people are the best on earth.

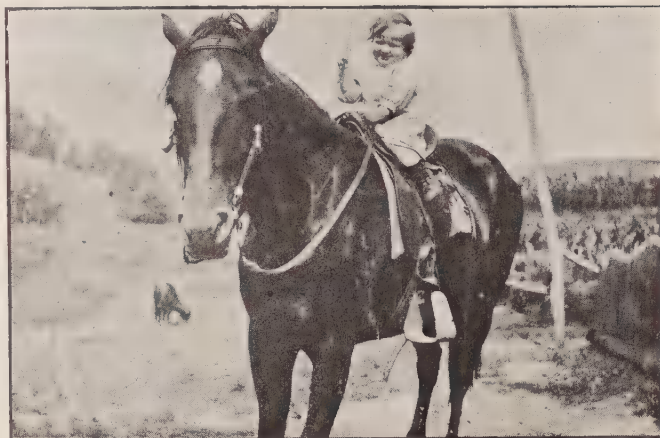
Not only had there been no change in the towns--there had been no change in the people, or the cus-

toms, or the roads, or the fields, or the mountains. There were the same clear-white, sparkling streams with never a bridge. There was the wide, shallow ford at Mouth of Wilson, where New River, to my childish eyes, was a mile wide. It had dwindled considerably but it was still there.

There were the same fat, healthy mountain babies playing among the laurels and rhododendrons along the roadsides and the same healthy, bare-foot boys riding to mill and postoffice. Mountain children learn to ride almost as soon as they learn to walk.

There was the spot at the old cross-roads in Ashe where the "hatter's shop" used to stand and, except for a few barbed wire fences that intersected it, old Gap Civil two miles north of Sparta, where the mountaineers of the counties had their "Muster Ground" before the war, was unchanged.

Ashe county has no improved roads, as we understand the term. It has many stretches of good road. The roads are worked under the old free labor system, and my observation leads me to believe that the peo-



"Mountain children learn to ride almost as soon as they learn to walk"

ple of Ashe and Alleghany do better work on their roads than is done in lowland counties where the same system prevails. Ashe county has been so busy trying to get a railroad built into it so as to get connection with the outside world that very little thought has been given to the building of a system of roads in the county and it will probably be many years before Ashe, and Alleghany county as well, will realize that their greatest need is not railroads but systems of public highways that would make their scenic wonders "get-atable" for tourists, and comfortably traversable for themselves and their children.

Ashe and Alleghany counties, in North Carolina, and Grayson county, Virginia, are all in the same boat as far as the road question is concerned. I spent a week in Grayson, a county in which ten years of my boyhood were spent, and while Grayson has secured two railroads and its towns have increased some in population, the roads are just as bad as ever. I used to think that the road from Edgewater, on Wilson Creek, to Grant, was the worst road in the world. Rocky, rough, muddy—I did not think it possible for the good farmers who live in the beautiful white houses on those great farms along Wilson creek to live there ten years and endure it, and I confidently expected to find that road improved. But I found it just like it was a decade ago. Not a particle of change from one end of it to the other. There were the same high boulders, a little more deeply rutted and scarred but I greeted them all as friends and brothers. I had bumped over them all

in the days long gone and I bumped over them again very cheerfully.

The saddest thing that I encountered in all that long journey through the mountains was an empty house. A decade ago it sheltered as happy a family of boys and girls as any house in the land. The head of the house was progressive. He had ideas beyond his time and community. He stood for improved methods in farming and, above all, for good roads. In 1898, I think it was, he and a few other far-sighted men, started a movement for a bond issue in Grayson county for road-building. I remember that our debating society took the matter up and as a boy I debated the bond issue question. Our best debaters were picked and



Horrible mountain road in Blount County, Alabama, before improvement

sent out to meet rival teams in other school houses in our township to debate the question and one of this man's sons was our best speaker. The fight was a hard one but the bond issue failed to carry and Grayson county dropped back into the rut and has been there all these years. This man, not discouraged, kept up the fight for several years, but he gave in at last. His boys, growing to young manhood, were dissatisfied with their surroundings and he finally decided to leave. Today this fine citizen lives in another state, amid a more progressive people and is one of the leaders in the county in which he lives. His boys have grown to manhood and are following in the foot-steps of their father, living lives of usefulness and service. The value of this family, alone, to Grayson county, cannot

be measured in dollars and cents and Grayson lost them because she refused to provide that without which there is no lasting progress—good roads.

And that home, which had been one of the best in all the land, was nothing more than a memory in the community and the old house was rotting down. I walked around it and through it and out in the decaying, unkempt orchard, thinking on these things, and I don't believe I ever spent a more miserable half hour. It was tragedy—that's all.

That was not the only empty house. I noted them all along the road. Between Roaring Gap and Sparta, in Alleghany county, I am sure there are, at the very lowest calculation, twenty vacant houses along the roadsides. Ten years ago every one of these houses, the most of them humble, to be sure, but homes, for all that, were occupied. Between Sparta and Jefferson, one sees a great many empty houses and between Sparta and Grant, Virginia, there are probably fifty or more. These are to be seen right along the "big road" and no attempt is made to estimate the number of vacant houses that dot the coves and valleys of those good counties.

Ashe county, instead of gaining in population in the last decade, lost 507. Alleghany lost 14. Grayson county shows a gain but all of the gain is in three or four small towns which have grown up with the coming of railroads and were not in existence when the census of 1900 was taken. Every country township shows a decrease in population.

Bad roads, alone, is responsible. I met a boyhood friend and schoolmate, a physician, who, like me, was making a visit to home folks. He said that he came back home to practice after he finished college and put in four years at the hardest work of his life, driving through mud, over stony roads, up well-nigh impassable grades, killing his horses and many times endangering his life. He woke to the fact that he was killing himself and doing his wife and babies an injustice by remaining there and he moved to a county of macadam roads, where peace and contentment reign and the people are prosperous and progressive. He is doing well, living and working in comfort.

He went on to name a dozen other bright young men who had left the mountains because of bad roads, physicians, lawyers, farmers, dentists, preachers, teachers and business men. Every one of them is making good.

The people of the mountains do not fret and chafe under the weary load imposed by bad roads, as do the people of the lowlands, and this very fact discourages the friends of the good roads cause. They accept their lot with a sort of fatalism and trudge through the mud stoically, resignedly. Occasionally, a high-spirited, impatient youngster, who has been away to college and got a taste of the benefits that come from good roads, or who has caught a vision of something better, breaks away, as this young physician did, from the ways of his fathers and pleads for better things, but the great majority of the young men of these mountain counties are following in the ways their fathers trod, bearing the same galling load that they bore and it has never even occurred to them that such a thing as a "365-day road" is possible.

What the future of this mountain section is to be none can tell. All around Grayson county there is progress. Wise, Lee, Smyth, Washington, Wythe and Tazewell counties are building macadam roads and perhaps Grayson will yet get in line. So far as I was able to observe, however, there was not the slightest indication of interest in road improvement. Ashe and Alleghany counties have not even good examples in counties surrounding to encourage them and it is go-

ing to be even slower there. In the southwestern part of North Carolina, things are humming. Bond issues are being voted almost daily and great things are being done. In time this will reach Ashe and Alleghany but it may be a long time.

But—my mountain trip was not all vacant houses and bad roads. Far from it. There was enough brightness every day to overshadow the sadness and I put behind me resolutely the evidences of unprogressiveness that I saw, balancing against them the goodness of the people of the mountains, their honesty, their fearlessness, their high standards and their unfailing



Mountain road in Blount County, Alabama, after it had been improved under the supervision of the Alabama State Highway Department.

charity, and my faith in their ability to work out their own salvation, along lines best suited to them, flashed out triumphant every time. I know that they will solve the road problem in time, just as they solved the liquor question and destroyed the cross roads grogshop and distillery years before the people of the lowlands took action against them. May their awakening be, not long delayed.

While the counties of Ashe, Alleghany and Grayson have nothing to offer the automobile tourist in the way of roads, they will prove a source of never-ending delight to the man who is content to travel behind a good horse, in a stout buggy, or take it afoot. There is no section of all the Appalachian region, from Georgia to the Canada line, that is more beautiful. If you want to spend a safe and sane, delightful vacation amid the most healthful surroundings and with the most

hospitable people on the face of the earth, follow the route I traveled. There is good fishing in hundreds of streams—trout in every brook and bass in New River.

I spent two weeks up there and I will always regret that I did not stay longer. As I was returning to

Thurmond I met Col. Fred A. Olds, of Raleigh, with his blanket roll strapped about him, his eager face turned to the Blue Ridge, hiking it for the regions that I had just visited and, oh, how I wanted to go back with him!

The National Road

By LAURENS ENOS

President A. A. A.

THE National Road is one thing needed to make this country a bigger and better and greater nation.

A vast amount of mis-information seems to exist regarding the usefulness of a national highway system. Primarily, it must be understood that every road entering into a system of national roads would be the main thoroughfare between centers of population and interest, and on that basis alone would be subject to a heavy traffic. Further, it is a well known fact that the principal road between important centers runs through the most thoroughly developed section of country within that region, with the most populous and progressive smaller cities and villages and the most thoroughly cultivated farming sections.

Nature has fixed the locations of most large cities; and almost invariably, in this country at least, it will be found that the richest and most prosperous communities lie along the path of the most direct communication between them. The construction of a national road system, therefore, would, in its through traffic features, accommodate a public from a wide belt of country through which the roads would run.

In its local traffic features the national road would serve all the purposes of a local road. Passing as it would through the most populous sections, it would carry a larger amount of local traffic than roads located where there existed less prosperity and less advantages. The interurban travel would reach its highest development, both between the smaller cities and the termini, and among the smaller cities themselves. With such a system, crossing every state in the union and reaching all important cities, it is not extravagant to assume that at least half the people of the country would be directly served, with benefits to the other half, while indirect, none the less pronounced.

There are still some people who assume to believe that national roads are sought for the sole benefit of a few automobile tourists. Such have not kept track of the commercial development of the age. It is true that long-distance traffic on through routes is motor driven. With horse traffic limited to 40 or 50 miles a day, travelers for business or pleasure naturally utilize the conveyance which will take them 300 or 400 miles. The motor car is often used instead of the railroad train for two reasons; it is not confined to time schedules; and it takes one where he wants to go. Traffic originates off as well as on the main road, many getting to the through road by the nearest route. Furthermore, the commercial aspect of the traffic of through routes is rapidly assuming greater proportions.

National roads would open up to greater settlement and greater productivity large areas of our western country, where there are now no means of transportation, where the states are too poor to build roads, and where local communities have no means of marketing products. With greater population and production,

markets would be created for the output of the factories of the manufacturing centers. The development and increase in production creates a general increase in commerce, in intelligence, and in civilization.

With a national road system built to withstand heavy traffic, values would increase and many more states would be able to extend their state systems and aid road building in counties and lesser divisions, which in turn would increase values, industries, and production.

Topics for Discussion at the American Road Congress.

How to systematize the purchase of road equipment and materials will be explained in a paper to be read by Henry G. Shirley, Chief Engineer of the Maryland State Roads Commission, at the American Road Congress, which will be in session during the week of September 29, at Detroit, Michigan. This paper deals with one of the many important subjects to be treated by experienced engineers, public officials and road contractors at the big meeting. The Maryland Commission has been working out the problems of good road administration in a most painstaking and thorough manner and Mr. Shirley's paper will undoubtedly present some interesting conclusions.

Col. E. A. Stevens, State Highway Commissioner of New Jersey, will have a paper at the Congress on the treatment which he has found most effective for worn out or raveled macadam surfaces. New Jersey was the first state to adopt the state aid plan for road construction and consequently has a large mileage of water bound macadam roads which are being adapted to new traffic conditions.

"The merit System in Road Administration," will form the subject of an address by President John A. McIlhenny of the United States Civil Service Commission, and will undoubtedly attract nation wide attention. Political favoritism incompetence and indifference characterize the administration of our public roads so generally as to cause a loss estimated by some experts as high as \$40,000,000 a year. Mr. McIlhenny's paper will show the demoralizing effect of political domination in road management and point the way to an efficient system which will mean skilled supervision, continuous and practical service and due economy.

The Mt. Vernon, Kentucky, commercial club has passed resolutions calling upon Senator W. O. Bradley to prepare a bill to be presented at next session of congress asking federal aid in the construction of the proposed national highway between Cumberland Gap and Crab Orchard, Kentucky, a distance of 95 miles over the old Wilderness Road route marked out by the noted Daniel Boone in 1775 for whom the highway will be named.

Pittsburg county, Oklahoma, will construct three bridges.

Highways of Western North Carolina

By DR. JOSEPH HYDE PRATT

State Geologist of North Carolina

THERE is perhaps no section of the south that is making more rapid advance in the construction of good roads than the western part of North Carolina. This section of the state represents the most rugged part of the whole Southern Appalachian Region, which means that the cost of building roads is the most expensive of all the southern region. Notwithstanding this fact, the counties composing the western part of North Carolina are taking up vigorously the question of building public roads, and are voting

making arrangements to employ a competent engineer to have supervision of the location and construction of the roads that are to be built with this bond money. If this is carried out, it will mean that hundreds of miles of first-class highways will be built throughout western North Carolina, so that within a very short time, it will be possible to travel to nearly all parts of the mountains over good roads.

The accompanying map, Figure 1, gives approximately the location of the good roads already completed in the mountain counties, and those that are being contemplated.

There are several special highways that cross the western part of North Carolina, and a brief description of these is given below:

Central Highway.

The Central Highway which extends from the mountains to the sea, and is the highway authorized by the general assembly of North Carolina of 1911, will, when completed, cross the following counties of western North Carolina: Madison, Haywood, Buncombe, McDowell and Burke. With the passage of the bond issues referred to above, the revenue for the construction of this highway via Madison county to the Tennessee line is assured. The route via Haywood county, following down the Cataloochee Creek valley, is not yet provided for. From Hickory to the top of the mountains the road is via Connelly Springs, which is a summer resort and contains a very good mineral spring; Valdesi, which is the center of a part of Burke county where there are a great many vineyards; Morganton, the county seat of Burke county; Bridgewater; Marion, the county seat of McDowell county; Old Fort, which was formerly the terminus of the Western North Carolina Railroad, at which point travelers took the stage to cross the Blue Ridge going to Asheville, Buncombe county. At Old Fort the highway begins to climb up the Blue Ridge, and some of the most beautiful scenery along the whole ridge is from here to Asheville. The road, as surveyed, will pass Round Knob, at which place there has been installed a fountain which throws a stream of water over 100 feet high. The highway climbs the mountain to Swannanoa Gap at a maximum grade of $4\frac{1}{4}$ per cent.

At Swannanoa Gap the highway enters Buncombe county, which is the banner county of western North Carolina as regards good roads. It has a first-class macadam and sand-clay road extending from the Gap to the Buncombe county line on the west, the highway passing through Blumont, at which place are the assembly grounds of the Baptist Association of the south; Black Mountain, one of the summer resorts of the mountains, 4 miles to the west of which is Montreat, where are the assembly grounds of the Presbyterian church of the South—a side trip which is very pretty going from Black Mountain to Montreat over a good macadam road and with several miles of drives within the grounds. The highway follows rather closely the Swannanoa River, a most beautiful stream. Within two miles of Asheville the highway passes through Biltmore, the business village or town of the Biltmore (George Vanderbilt) Estate. This estate, consisting of over 125,000 acres, has a great many miles of beautiful road within it, but up to the present time



DR. JOSEPH HYDE PRATT
State Geologist of North Carolina

bonds for this purpose. The following counties and townships have authorized bond issues, and these have either been sold or will be sold:

Cherokee—Valleytown & Murphy townships	\$ 75,000
Graham—One township	15,000
Macon—Franklin township	100,000
Jackson—Cullowhee, Sylva & Dillsboro townships	80,000
Henderson—Several townships	100,000
Buncombe—Two townships	70,000
Madison—County bonds—(1 township \$10,000)	310,000
Yancey—County bonds	150,000
McDowell—3 townships	85,000
Rutherford—County bonds	300,000
Polk—County bonds—(1 township \$12,000)	112,000
Burke—Morganton township	50,000

Total \$1,447,000

Of the above amount all but \$122,000 have been authorized to be sold within the past four months. Several other counties, as, Avery and Caldwell, are considering the issuance of bonds.

One gratifying thing in connection with the bonds that are being issued by these mountain counties is that practically all the counties and townships are

these roads are not open to the automobile traveler, there being but one road, that going to the top of Mount Pisgah, which will be mentioned later.

The road Biltmore to Asheville is of especial interest, inasmuch as it was the first improved macadam road built in Buncombe county and was constructed under the supervision of the Asheville and Buncombe County Good Roads Association, which raised the money to pay for the work by private subscription. Since that time this association has been constantly at work encouraging the improvement of roads in Buncombe county and western North Carolina, with the result that Buncombe contains the largest number of miles of improved road of any county in the western part of the state, and Asheville has become practically the hub of the good road work in that section of North Carolina. The city is most beautifully situated on the hills rising from the French Broad Valley, and, with its attractive hotels—as the Battery Park, the Manor, and

try and replace this old public road. The general assembly passed an act authorizing the state convicts to build 15 miles of road from the Tennessee line toward Asheville to compensate for the road taken over by the railroad. This road will be a link of the Central Highway, and has been located from the Tennessee line as far east as Stackhouse via Hot Springs. The route via Haywood county is from Asheville via Candler and Turnpike, Buncombe county; Canton, Waynesville and Cove Creek, Haywood county. At Candler there is a beautiful side trip that can be made over the Vanderbilt Highway from this place to Mt. Pisgah. This road is macadamized and open to automobile travel. At Canton is the large Pulp Mill of the Champion Fibre Co., which is one of the largest pulp mills in the south. Waynesville, the county seat of Haywood county, is a very attractive mountain city with many beautiful drives.

The Central Highway will be the gateway from



Highways of Western North Carolina

the Victoria Inn—makes a most delightful place for the tourist who is automobiling or coaching through the Appalachian Mountains, to make his headquarters.

At Asheville the Central Highway diverges: one route being via Madison county to the Tennessee line and the other via Haywood county. An engineering corps is now at work in Madison county surveying the road from the Tennessee line to the Buncombe county line. Just where the highway will be located in Madison county has not yet been determined. The old stage road from Asheville to Knoxville, Tenn., which followed the French Broad River was taken over by the railroad, when it was constructed; and, although a part of the contract between the county and the railroad was that the railroad should provide a public road to take the place of the one occupied by the railroad, this was never done. And it was not until 1913 that the state took any definite action to

Tennessee into the mountain region of North Carolina; and, when Tennessee has continued this highway from the line to Knoxville, it will be used constantly by automobilists and others as a means of access to the mountains.

Asheville, N. C.—Greenville, S. C., Highway.

This highway extends from Asheville to Greenville, S. C. via Biltmore, Arden, Fletcher, Hendersonville, Flat Rock, Ziconia (Tuxedo,) Green River to Greenville. The road is graded all the way to the South Carolina line, and most of the distance has been macadamized or sand-clayed. Greenville county, South Carolina, has arranged to build their link of this highway, and it is expected that it will be completed within a very short time. This route will be one of the main entrances to the mountains for the people of South Carolina and Georgia.

Hendersonville, N. C.—Spartanburg, S. C., Highway.

This highway extends from Hendersonville, N. C.

via Flat Rock, Saluda, Tryon, Campobello to Spartanburg, S. C. The route of this highway has been surveyed, and the passage of the bond issue by Polk county now provides revenue for completing this road amongst others that the county will build.

Crest-of-the-Blue-Ridge-Highway.

When the Crest of the Blue Ridge Highway has been worked out in its entirety and has been completed, it will extend from Virginia to Lallulah Falls, Georgia, connecting in the former state with the Bristol to Washington Highway, and in the latter State with the National Highway. The construction of this highway, on account of its location through the most rugged mountains of the whole Appalachian system, will be expensive, and it will take some years to com-



Blazing a trail for the Crest of the Blue Ridge Highway. A large part of the route is through trackless forests

plete it; yet it is confidently believed and expected that this route will be completed and open for travel within a very few years. In the course of its construction, it will try to be arranged so that as mile after mile of the highway is completed, it can be thrown open for travel.

There are several communities in Virginia that wish to have the Crest of the Blue Ridge Highway pass through their section, and those who are interested in its construction are now corresponding with the people of Grayson county, Virginia, and with Bristol, Virginia-Tennessee. The route of the Crest of the Blue Ridge to pass through Grayson county, Virginia, would keep closely to the crest of the Blue Ridge, this to branch off at Boone, Watauga county, and extend toward Bristol, Tenn. Preparations are already being made to build from Bristol, Tenn., to the North Carolina line via Magnetic City, and the people of Grayson county are contemplating the issuance of bonds to further the construction of this highway. According as to which of these routes is selected, the Crest of the Blue Ridge Highway will cross in North Carolina, Alleghany, Ashe and Watauga counties converging at Boone, where a toll road is already constructed from this point to Linville in Avery county. From Boone to Linville, a distance of 32 miles, the road is well graded and open for automobile traffic. The route is via Blowing Rock, a noted resort of this section of the Southern Appalachian region, which is situated on a ridge at an altitude of about 3600 feet. The views from this ridge into the deep valley on the headwaters of John's River are equal to, though very dif-

ferent from, the views into the canyons of the mountains of western United States. From Blowing Rock to Linville the route is over the celebrated Yonahlossee road. This road was the first good road built in the mountains of North Carolina, and was constructed by S. T. Kelsey. A graded road 22 miles long connects Blowing Rock with Lenoir, Caldwell county. Linville is a unique mountain resort in the upper valley of the Linville River, which combines a most delightfully cool climate with 70-odd miles of stream trout fishing, a large lake for lake fishing and a golf course of considerable renown. Esseola inn and cottages are equal to any in the Southern Appalachian Mountains. From Linville to within a few miles of Linville Falls the road is now partly completed, and can be used by automobiles, although there has been no surfacing material used on the road and it gets very heavy in wet weather. The road passes through Altamont, Grassland and Pineola. At Pineola and Linville Falls there are well-equipped inns that are open for the accommodation of tourists during the summer season. At Linville Falls the tourist will find the Linville gorge and valley a most attractive place to visit.

From Linville Falls to Asheville, a distance of approximately 96 miles, the route is through an entirely new country through which no road has been thought of until the "Crest of the Blue Ridge Highway" was advocated. From Linville Falls to Altapass, a station on the Clinchfield Railway, the highway will be an entirely new one, and follows very close to the summit of the Blue Ridge, and will open up to the traveler some beautiful scenes in the Piedmont Valley via Brushy Creek Gap, Humpback Mountain, Hog Gap and Rose Creek Ridge and McKinney Gap, which is now within two miles of Altapass, the highest point on the Carolina, Clinchfield & Ohio Railway. The distance from Linville Falls to Altapass is about 11 miles, and of this distance 7.2 miles of the highway have already been graded at a cost of approximately \$3900.00 per mile.

As this highway ascends Humpback Mountain from the west, it has opened up some of the most beautiful sections of mountain country that will make ideal resorts. And already preparations are being made for developing large tracts of this land.

Leaving McKinney Gap the highway will follow on the southern and eastern side of the Blue Ridge to Gillespie Gap, from which point there is a good road to Little Switzerland, a new resort that has been started within the past few years. Leaving Little Switzerland, the highway will pass through Bear Wallow Gap, Gooch Gap, and then cross ridges and around peaks to Blue Ridge Meadows, and then practically with the Crest of the Ridge to Buck Creek Gap. From Buck Creek the highway is via Big Laurel Gap, Toe River Gap and Stepps Gap, the latter being the highest point of the highway, where it reaches an altitude of approximately 5500 feet, being within 1200 feet of the top of Mt. Mitchell, the highest mountain east of the Rockies, with an elevation of 6711 feet. At Stepps Gap the highway will be in the heart of the Black Mountains, and from there to Bull's Gap, a distance of 26 miles, the highway crosses some of the most rugged mountains in the whole region. The highway passes around Mt. Gibbs, Clingman's Peak, Potato Knob, and along the east side of Black Stock Knob. Here for some distance Mt. Mitchell and the other peaks of the Black Mountains are in full view. From Black Stock to Balsam Gap, which represents the end of the Black Mountain range, the highway is along a ridge which is the dividing line between the Asheville watershed on

the west, which contains an area of approximately 10,000 acres, and the celebrated Murchison boundary on the east, which contains 13,000 acres of magnificent virgin forest. From Balsam Gap the road follows Peach Orchard Ridge, climbing up to the summit of Bull Head Ridge, a rise of 700 feet. There is then an easy grade down to the gap between the Dome and Bull Head, and thence on the southwest side of Craggy Pinnacle through Craggy Gap to Craggy Fields, which has already been used a great deal by camping parties and is a magnificent site for a hotel. From Craggy Fields the highway will follow on the western side of Craggy Knob, through Carter's fields, and along the south side of Snow Ball Mountain to Potato Gap. Then, crossing ridges and passing in and out of coves, the highway passes on the west and north sides of Lane's Pinnacle, Courthouse Knob and Richland Knob to Bull Gap. A short distance out of Bull Gap is Rattlesnake Lodge, the summer home of Dr. C. P. Ambler of Asheville. From Bull Gap to the Sunset Mountain the highway follows an old tram road which only needs revision for about two and one-half miles. From Sunset Mountain to Asheville, a distance of five miles, the highway has recently been completed by Mr. E. W. Grove of Asheville and St. Louis. It is of macadam, well graded, and its ever-changing views are a constant source of pleasure to the traveler.

From Asheville the "Crest of the Blue Ridge Highway" will be via Hendersonville, to which place, as already stated, the road has been constructed. From Hendersonville to Brevard, a distance of 20 miles, there is a fair country road. Leaving Brevard, Transylvania county, the highway follows up the French

Broad Valley and crosses the Blue Ridge to Toxaway Lake, from which place for nearly 10 miles the route of the highway will be through the well-known property of the Toxaway Company, which has been called the Sapphire country. At Brevard is the Hotel Franklin, and at Toxaway is the Toxaway Inn. The Toxaway country is very picturesque and the three lakes add a great deal to the beauty and grandeur of the scenery. From Lake Toxaway to Highlands the highway passes Lake Sapphire and Fairfield Lake, through Cashiers Valley around Whiteside Mountain to Highlands, the highest town in the state. Plans are now on foot to open up a first-class automobile road from Asheville to Toxaway Lake which will then open up to the automobilist perhaps the most attractive mountain resort in the Southern Appalachian region. The management of the Toxaway property will also continue the good road around Lake Toxaway, a distance of 15 or 20 miles, and through the property around the other lakes, and meet the road from Cashiers Valley.

From Highlands to Tallulah Falls, a distance of about 30 miles, the road will have to be entirely re-located.

Asheville-Charlotte Highway.

A portion of this highway extends across Buncombe, Henderson, and Rutherford counties, and passes through Hickory Nut Gap and Chimney Rock regions. The greatest obstacle in the completion of this highway was the 7 miles to be built across the extreme northeast corner of Henderson county from Chimney Rock to Hickory Nut Gap, which represents the hardest and most expensive link of this highway to build.



Fine top-soil road toward Baker's Mountain in Hickory township, Catawba County, N. C. This township has voted bonds for \$80,000 to complete its part of the Central Highway and building a township system of roads



Section of the fine sand-clay road between Asheville, N. C., and the Haywood county line

The General Assembly of 1913, however, passed an act authorizing the use of state convicts in the construction of what is known as "The Hickory Nut Gap Highway." The route has been surveyed, and the convicts will be put to work on this highway just as soon as they become available. This section of the mountains is very attractive to tourists, and even now large numbers of them visit this section, although they have to travel over many miles of poor road. Delightful hotel accommodations can be had at Chimney Rock and Bat Cave.

Buncombe county is now completing her link of this highway from Asheville via Bluemont and Fairview to Hickory Nut Gap. Rutherford county, which recently passed a bond issue of \$300,000, has already appointed an engineer to have charge of her road work, and he is now locating Rutherford county's portion of this highway. The townships of Henderson county through which the highway passes are making subscriptions for the Henderson county link. When completed this highway will probably be one of the most attractive and most used highways leading into the mountains.

Knoxville, Tenn.-Atlanta, Ga. Highway.

The people of eastern Tennessee are taking up the problem of working out a route from Knoxville, Tenn. to Atlanta, Ga., through the mountain region. While they will have one route from Knoxville to Asheville, Hendersonville, Greenville, S. C. to Atlanta, they want a more direct route; and are now considering the

feasibility of crossing the Southern Appalachian Mountains following approximately the valley of the Little Tennessee River, which would take them across Swain and Macon counties, North Carolina.

While Swain county has as yet done very little in regard to the construction of good roads, Franklin township of Macon County has recently voted \$100,000 worth of bonds, and this proposed highway would pass through this township. The link of the highway across Macon county, following the Little Tennessee Valley, can be easily constructed and at a comparatively low cost per mile. At Tallulah Falls, Georgia, this highway would converge with the Crest of the Blue Ridge Highway.

Asheville-Murphy Highway.

Another highway that is being discussed is to connect the extreme southwestern county of North Carolina with Asheville. Long before the railroad was built from Asheville to Murphy, the state of North Carolina made an appropriation and surveyed a route for a public road from Buncombe county to Cherokee county. The suggested route of this highway is from Asheville via the Central Highway to Waynesville; then via Balsam Gap to Sylva and Dillsboro, Jackson county, and then across the Cowee Mountains to Franklin, Macon county; then via Aquone, across the Valley River Mountains to Andrews, and thence to Murphy. Several links of this highway are already pro-

vided for by the roads which will be built by bonds already issued. Thus, from Murphy to Andrews, the road is practically completed. In Jackson county, Sylva and Dillsboro townships have issued bonds, and thus will provide for the construction of a portion of this highway. At Sylva a road has been suggested via Cullowhee to Glenville and to Cashier, where it would join the Crest of the Blue Ridge Highway.

This Asheville-Murphy Highway would, upon completion, become one of the most important of the mountain highways, and would open up sections of the mountain region that would become most attractive for those who not only wanted to build summer homes but also permanent homes in the mountains.

Asheville-Burnsville-Spruce Pine Highway.

This highway, with the exception of that portion in Mitchell county, is practically provided for, as all the others through which it passes have sufficient road revenue with which to build their links. In Buncombe county, the route would probably be via Weaverville, Stocksville, Democrat, and then across a short stretch of Madison county; then through Yancey county to Burnsville. From Burnsville the Highway would be via Micaville, entering Mitchell county at Crabtree Creek. At Spruce Pine, it would only take four miles of highway to connect with the Crest of the Blue Ridge Highway at Altapass.

Lenoir-Blowing Rock Highway.

This highway is a toll road, and is at the present time the main entrance from the Piedmont Region to the crest of the Blue Ridge Highway.

From Edgemont, the terminus of the C. & N. W.

Railway, a graded road has been built to Linville.

Several other roads are being discussed, such as: the road from Marion to Buck Creek Gap.

As will be seen from the map, the location of these highways through the western Southern Appalachian Mountain region, when completed, will have a great many drives or routes for the tourists. These are especially desirable for the automobile tourist and for those who want to take driving trips from any of the large tourist centers.

Another factor that adds a great deal of interest to the Southern Appalachian Mountain region is the forest reserves that are being obtained by the federal government. All of these forest reserves will be opened by trails and roads, and it has been the policy of the federal government to build roads wherever it is deemed necessary, and these roads are usually open to the public. Several of these forest reserves are on the route of the highway described above, and it is expected that the federal government will provide the revenue with which to build a portion of these highways that are wholly within the forest reserves.

The completion of the highways referred to above will increase the tourist trade of the Southern Appalachian region ten or more fold, and will add millions of wealth to that section of the south.

There is no reason why the Southern Appalachian region should not be just as attractive to the automobile tourist as Switzerland, Northern Spain, France, Germany, and England; and with the completion of these systems of roads, it will attract them, and a considerable percentage of the hundred or more million dollars that are now being spent in those countries will be spent in the Southern Appalachian Region.



A stretch of Sand-Clay Road between Williamsburg, Va., and Historic Jamestown.

In and Around Buncombe County

By N. BUCKNER

Secretary Asheville (N. C.) Board of Trade

THE Land of the Sky" in Western North Carolina is all atingle with the good roads spirit. The splendid system of roads in Buncombe county, which carry out from the 38 miles of paved streets in Asheville in all directions to adjoining county lines, and will soon be joined with good roads across adjoining counties, strong with good roads already made in counties west and south.

To the west, Haywood county is just building a splendidly graded and surfaced road from Waynesville to the Buncombe county line, passing the great Assembly Ground and Convention Hall of the M. E. church. South, a few miles east of Waynesville. This road is a part of the northern branch of the Southern National Highway, which reaches from ocean to ocean, enter-

drained. The French Broad River through Madison county flows between great high mountains on either side, affording unsurpassed scenic beauty. One point on the road has doubtless been famous for the remarkable wild beauty of the great bend, known as Bailey's Bend, in the French Broad River as indicated in illustration, and which is on the line of the great Southern National Highway.

Henderson county, to the south of Asheville, has a most excellently graded pike from the Buncombe coun-



MR. N. BUCKNER
Secretary of the Asheville Board of Trade



"Although the top of Chimney Rock is more than 100 feet away from the main mountain, it has a solid granite front, sufficient soil on top, to support vegetation and a small pine tree." Chimney Rock may be seen from the Asheville-Charlotte Highway

ing San Diego, California, via Asheville, Knoxville, Nashville, Memphis and Roswell, New Mexico. This northern branch leads via Waynesville to near the Tennessee state line, while the southern branch extends via Mars Hill, Marshall, and down the beautiful French Broad River to the Tennessee state line.

Madison county, immediately to the west, has just issued \$300,000 in bonds to build a system of macadam roads through that county to join on to the good roads of Buncombe county, west of Asheville. In addition to this, at the last legislature, a bill was enacted placing 50 convicts on the main line of the Central Highway, opening up a road which a quarter of a century ago was the main artery of travel from east to west and west to east, as a toll road. At that time, great droves of hogs, cattle, sheep, and turkeys were driven off to the markets of the east. The old East Tennessee, Virginia and Georgia railroad acquired the charter of the old highway and built thereon a line of railroad from Tennessee points into Asheville, and the old road was never reopened. The act just referred to will reopen this road on an easy grade, covered with macadam and well

ty line, not only to Hendersonville, but south to the state line, and from thence to Greenville, South Carolina, where the New York to Atlanta highway is tapped. Henderson county has just sold \$125,000 in bonds, with which to sandclay the present most excellently graded roads and to build and macadam or sand-clay additional new roads throughout the county in all directions.

To the east, that stretch of the Southern National Highway, or the Central Highway of the State of North Carolina, is in most excellent condition to the top of the mountain, the Great Divide, where McDowell county has just voted \$30,000 in bonds to construct the six-mile link of the road in Old Fort township to the top of the mountain at Swannanoa Tunnel. This link of the Central Highway, or Great Southern National Highway, passes through mountain scenery unsurpassed on the American continent. While the actual distance is

only about 6 miles the way the road will be constructed will total about 12 or 15 miles, following the general line of the Southern railway, which winds up and across the mountains at this point. Immediately at the top of the mountain, and at the east mouth of the Swannanoa Tunnel, which runs 1800 feet through the mountain, is a mineral spring of considerable value. This spring is located on the very backbone of the Great Divide, and part of its waters flow eastward into the Broad River and thence to the Atlantic Ocean, the other portion flowing west into the Swannanoa and French Broad Rivers to the Mississippi river, and thence into the Gulf of Mexico. Here, too, is located the great assembly grounds of the Southern Baptist Convention, the Southern Methodist church, the Presbyterian church and the Young Men's and Young Women's Christian Association, the mountains round about being dotted here and there with beautiful cottages, the attractive summer homes of people coming here to attend the many conventions held by the various churches, Y. M. C. A. and Y. W. C. A. organizations and others.

The first sand-clay road constructed in Buncombe county was through the Beaverdam Valley, connecting the Beaverdam road with the Leicester road. This stretch of road is about four or five miles long, has been constructed five years and has given splendid satisfaction.

Another sand clay road constructed 2½ years ago, is from Weaverville north to Democrat, a distance of 6 miles. The first winter was very bad and wet, and the road during the mixing process was in such condition as to bring down upon the heads of the commissioners and county engineer the maledictions of travelers through the north end of the county to Asheville. However, the weather conditions were ideal for the proper mixing of the sand and clay, and this road following its first winter has proved the value and worth of sandclay for good roads purposes, the people all along the line being well satisfied with the condition of the road.

The road from Asheville to Fairview and through

the famous Hickory Nut Gap and Broad river gorge to Charlotte is in splendid condition from Asheville to the Henderson county line near the gap and from Bat Cave on towards Charlotte, leaving on the mountain between Bat Cave and the gap a link now impassable to motor cars. The last legislature passed an act requiring this link to be constructed by convicts and before the middle of July a force of 40 or 50 convicts will be put on this road, making of it a fine road, connecting the constructed parts of this highway and affording a direct automobile road from Asheville to Charlotte through what is perhaps the most wonderful river gorge in America, with the Great Chimney Rock as a sentinel at the eastern end of the gorge, standing more than 325 feet high from its base, with a cap stone 40 feet across, fitting snugly on top.

In addition to the convicts, there will be a large squad of paid labor, and the people along the line and in Asheville are subscribing liberally to the fund for the completion of this piece of mountain road. The work of construction will be under the direct supervision of Dr. Joseph Hyde Pratt, state geologist, and that means that the road will be pushed to completion and will be a model mountain automobile road.

Although the top of this chimney rock is more than 100 feet away from the main mountain, it has a solid granite front, sufficient soil on top to support vegetation and a small pine tree.

The first good roads association south of Mason and Dixon's line was established in Asheville in 1899, the Asheville and Buncombe County Good Roads Association. This organization has been and is one of the largest promoters in the creation of good roads sentiment and in preaching the gospel of good roads and their beneficent results. There has not been a good roads meeting or convention of any kind held within 500 miles of the city but that there have been a number of Asheville men belonging to this organization in attendance working for good roads and for the betterment of roads throughout this territory and the south. At the time of this organization there were practically no good roads in Buncombe county, of which Asheville



Looking East from the mouth of the Swannanoa Tunnel, Old Fort lies to the East, far down the valley.

is the capital, except in the famous Vanderbilt estate which has about 35 miles of perfectly smooth and well kept macadam roads encircling the estate and winding in and out among the beautiful hills and mountains surrounding this famous private home, Biltmore. Immediately after this association, the Asheville and Buncombe County Good Roads Association, was organized, it raised \$5,000 by subscription and macadamized the road leading from Asheville to Biltmore station, two miles.

This one piece of road demonstrated forcibly to the citizens of the community that good roads could be built in the mountains and it stimulated the citizens to further effort. Since then, the county has built approximately 100 miles of macadam and sand-clay roads, net-working the county in all directions leading out of Asheville. The very progressive board of county commissioners is spending from \$40,000 to \$60,000 a year maintaining large forces of both paid and convict labor building new stretches of road in addition to maintaining the roads already constructed.

The good roads association has settled many disputes between property owners where roads have been relocated and widened, thus saving court costs; it has acted as arbiter where usually juries have had to be appointed for condemnation proceedings; it has straightened sharp curves, widened embankments, and made reports of bad places in county roads and city streets to the county commissioners or board of aldermen as the case might be. One of the features of the work that has won the praise and good will of every visitor and citizen of this territory is the fact that it has placed sign boards at all cross roads throughout the county giving distances to Asheville and to other points.

During the summer of 1911 the county commissioners went on record with the statement that they would meet any adjoining county at the county line with a good road—macadam or sand-clay. In this they have made good, two good roads having been built to the county lines on the north and on the south, another to the county line on the west, and the fourth nearing completion to the county line on the east.

George W. Vanderbilt has built a splendid automobile road from the Hominy road west to his summer lodge on Mt. Pisgah, and the distance from Asheville to this lodge can be made in 50 to 65 minutes.

The famous exclusive auto-way built to the summit of Sunset mountain, overlooking Asheville to the east, and open to the automobile public the latter part of 1911, by E. W. Grove, who is building Grove Park Inn, said to be the finest tourist hotel in the world, is now being widened and made into a fifty-foot boulevard to Grove Park Inn, and from the Inn to the summit of Sunset, 3,117 feet above sea level, and nearly a thousand feet above and overlooking Asheville and the Asheville plateau, will be made 40 feet wide and the entire length surfaced with asphalt binder. This boulevard will be $3\frac{1}{2}$ miles in length, or $5\frac{1}{2}$ miles long from Pack Square in the city of Asheville. The road winds back and forth about the face of Sunset Mountain, affording wonderfully beautiful vistas of the city, of French Broad Valley and the mountains beyond, while at the top is spread out a scene of vernal beauty absolutely unexcelled in all the world. The summit of Sunset is a rounded peak, sitting in position as it were, nearly to one side of the bottom of a great bowl, affording a complete view of the entire circle of the horizon. To the east the run of mountains swings within a couple of miles of Sunset, breaking away as the skyline flows northward and westward to a distance of possibly 40 miles, where Mount Pisgah rears its head into the heavens at a height of nearly 6,000 feet above sea level.

Pisgah and the Rat, the latter mountain, which has the appearance of a little rodent stretched along the horizon with its nose pointing into majestic Pisgah's towering form, make one of the most pleasing views the eye has ever beheld.

The construction of good roads has been one of the underlying causes of the growth of Asheville and Buncombe county and western North Carolina. Asheville is the very center or formation head of the scenic good roads system of the south, and all good roads throughout the entire southeastern territory are heading to



Left, on a fine grade, is a section of the Central Highway and Southern National Highway

Asheville because of the matchless natural beauty of the mountains in the Land of the Sky, the crisp, invigorating air, the many sparkling water-falls and pure

water, with Asheville the metropolis of that wonderful section, the ideal mountain convention city of the south.



One of the many thousands of Beauty Spots on the Asheville-Charlotte Highway, through Hickorynut Gap. A short section of the road may be seen in the distance as it follows the windings of turbulent Broad River

Central Highway in Old Fort Township

By DONALD M. McINTOSH, M. D., Old Fort, N. C.

AN ELECTION was held in Old Fort township on the 13th of last May for the purpose of issuing bonds to the amount of \$20,000 for road improvements.

The issue carried by a majority of four to one, thus placing the progressive township in the good roads column.

It is the intention of the township commissioners to place this amount on the Central Highway if they can get \$10,000 of the government money that has been appropriated for roads in North Carolina, as it is believed that the road can be constructed through the township for \$30,000. The Governor is endeavoring to have that amount placed there.

An application has been made to the government for an engineer and it is expected that one will soon be on the ground to select the most practical route across the mountain and superintend the construction of the road. There will be very little grading necessary east of Old Fort as the road now in use that will probably be selected for the route of the Highway, is the best graded road in the township. It is going west from the town, across the Blue Ridge mountains, where most of the work will have to be done. About three miles of this stretch has been graded but the remaining four miles will have to be built where not even a trail now exists.

The bridges that necessarily will have to be built

across a few streams will be provided for by the county.

Work will begin on the road as soon as the bonds are sold and it is hoped that the road will be in use before winter begins.

This direct route to Asheville from the eastern part of the state—besides markedly shortening the distance—will open up a magnificent country with unsurpassed scenery. The road will pass near the foot of the lofty Pinnacle, through the center of the Round Knob property and within a few miles of Mount Mitchell. It will take the traveler into the very heart of the mountains from the lovely level stretches in the valleys to a road that apparently hangs in mid-air so precipitous are some of the lofty mountain sides.

Mr. A. M. Black Wins Prize.

Mr. A. M. Black, of Tazewell, Virginia, wins the prize of \$2.50 offered by Southern Good Roads for the month of July for the best photograph of a good road. Out of the many photographs of beautiful stretches of road submitted, it was no little task to pick the best. Mr. Black's photograph appears in this issue.

The contest is a monthly affair and is open to everybody, professionals and amateurs. Contestants have evidently overlooked the fact that a prize is offered for photographs of the worst pieces of road, as well as for the best. None was submitted. Full particulars as to the contest appear elsewhere in this issue.



On the Asheville-Charlotte Highway, along the Broad River. This picture was taken from the top of Chimney Rock and from this height the road and river look like silver threads below



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DR. JOSEPH HYDE PRATT, State Geologist of N. C.	} Associate Editors
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Official Organ of the North Carolina Good Roads Association

HENRY B. VARNER, President, Lexington, N. C.
DR. JOSEPH HYDE PRATT, Secretary, Chapel Hill, N. C.

Official Organ Southern Appalachian Good Roads Association

DR. JOSEPH HYDE PRATT, President, Chapel Hill, N. C.
HENRY B. VARNER, Secretary, Lexington, N. C.

Official Organ of the South Carolina Good Roads Association

F. H. HYATT, President, Columbia, S. C.
FINGAL C. BLACK, Secretary, Columbia, S. C.

VOL. VIII.

JULY, 1913.

No. 1.

VOLUME VIII, No. 1.

With this issue Southern Good Roads enters upon Volume VIII and we are celebrating the event by making this a "Mountain Number." The magazine has no stronger and no more loyal friends than its friends of the mountains and it is our hope that the special articles herein contained, written by natives of the mountains and others familiar with every detail of road construction in the mountains, will be very pleasing to them.

We acknowledge our indebtedness to Mr. N. Buckner, the hustling secretary of the Asheville Board of Trade, Col. Fred A. Olds and Dr. Joseph Hyde Pratt, for the very fine photographs that fill our pages. Mr. Buckner was especially helpful and without his assistance, we would have fallen far short of the excellence which we feel that we have attained.

We regret that we were unable to enlist the interest of good roads enthusiasts in the mountains of Tennessee, Georgia and Virginia in time to give those regions the attention they deserve. It was our intention to cover the entire southern Appalachian region and we will do it next time.

Southern Good Roads, in passing another milestone, desires to extend its thanks to its ever increasing army of faithful readers. From the beginning we have known no falling off in circulation and our gains while not startling or spectacular, have been steady.

THE NORTH CAROLINA GOOD ROADS ASSOCIATION.

As noted elsewhere in this issue the annual convention of the North Carolina Good Roads Association is to be held at Morehead City the last of this month. Indications are that attendance on the convention will be large. It is planned to have present Hon. Jonathan P. Bourne, Jr., former senator from Oregon, chairman of the joint congressional committee now at work compiling information as to road-building for the use of congress. He is an eminent road authority and will have something to say worth listening to.

We hope that the association will get down to business in the right way and do things. There are too many associations that do but precious little except meet in annual conventions, orate and listen to orations and make a big show. The North Carolina Good Roads Association has never been of this class and we hope that it will set a good example for all associations, all over the land, by accomplishing even greater things in the future than it has in the past.

Meet us at Morehead.

THE NEED OF STATE SUPERVISION IN NORTH CAROLINA.

Since Feb. 1, 1913, North Carolina counties and townships have voted \$2,650,000 for the construction of public roads, thus indicating that they are ready to do their part toward giving the state a system of good roads. A question at once arises, will the expenditure of this money in road location and construction be done under the supervision of men who know how? Thirty applications have been received by the North Carolina Geological and Economic Survey for engineering assistance in road work, but they have had no funds with which to give this assistance. It would not cost the state of North Carolina one per cent of the amount appropriated by the counties, by bond issue and direct tax, for road work, to enable the state to give to the counties the engineering assistance that would insure an economical and wise expenditure of the road fund. Many of the counties are employing competent men to take charge of their road work; but some are not. Some of the townships feel that they cannot afford to employ an engineer. Thus there will be a certain amount and perhaps a considerable amount of the moneys appropriated for road work that will not give the results expected and in some instances will not give well located and constructed roads.

Can the state afford to permit counties and townships to lose their road funds by lack of proper engineering assistance, especially when the state can give their assistance at a cost of less than one per cent of what the counties are giving?

WIDE TIRES.

Wide tires on heavily loaded wagons will do more to keep roads in good condition and reduce the cost of maintenance than anything else. It is an undisputed fact that narrow iron-tired vehicles are one of the

main causes of the rapid deterioration of our public roads. Vehicles should have tires with a width in proportion to the load the vehicle can carry, the tires ranging from two to eight inches. If the front axle was shorter than the rear axle so that wheels would not tread it would still further decrease the cost of maintenance.

Such wagons are not at the present time on the market to any great extent, and the demand for them will be determined by road regulations that will require their use.

A state or a county that taxes itself to raise revenue with which to build good roads has the right to regulate traffic on these roads. It is fair and equitable that the users of narrow iron-tired vehicles should be pro-

hibited from the improved public road or should be required to pay a heavy privilege tax for using the road which shall be in proportion to the damage they do to the road. County or road commissioners should be given the authority to make such regulations as will insure that vehicles will do the minimum amount of damage to the road.

A national road convention whose main object would be to crystallize sentiment and public opinion to the need of regulation regarding the with of iron tires on vehicles, would do a great deal toward solving the problem of the maintenance of our public roads. Such a convention should be made up of not only users of the roads but of manufacturers of wagons and other vehicles.

Annual Convention North Carolina Good Roads Morehead City, July 30-Aug. 1

It has been decided to hold the annual convention of the North Carolina Good Roads Association at Morehead City July 31st and August 1st. The convention of 1912 was held in Charlotte and was largely attended, there being from three to four hundred delegates present, and it is believed that through the work of this organization the wonderful activity for good roads which has recently been shown in western North Carolina is in large measure due. During the past few months counties and townships in western North Carolina have issued about \$1,300,000 in bonds for good roads. Bond issues, however, have not been considered so favorably in Piedmont and the eastern counties, and for this reason it has been thought wise by the Executive Committee of the Association, to hold the 1913 Convention in the eastern section of the State. It is therefore expected that Piedmont and eastern North Carolina will rise to the occasion and make this Convention the most successful one held so far as attendance is concerned and that it will be the means of arousing an interest in road building in this section of our State. Just preceeding the Convention there will be made a tour over the Central Highway by the Central Highway Committee, who have invited the Governor and the State Geologist to take part in the tour of inspection. In connection with this tour it is expected that many automobilists will make the trip to Morehead along with this party.

The Convention will be made one of especial interest to the practical road men of the State as questions of road maintenance, road construction, and road problems met with in the mountain, Piedmont, and eastern sections of the State will be taken up in detail. The advisability of the use of wide tires will be discussed and plans devised for increasing their use. Both State and Federal aid in road work will be discussed, and it is expected that Senator Bourne, the Chairman of the Senate Committee on Federal Aid in Road Work, will attend the Convention. He has made a study of the various details of Federal Aid and his address will be most instructive.

Delegates will be appointed to represent the various counties, towns, associations, etc., for the invitation is extended to every citizen of the State interested in the promotion of this cause which means so much

to our State's advancement to attend and help to make this convention the most successful one yet held. The Association is making the good roads work of the state a success, and the building of every mile of highway in the state will add just so much more to the prosperity and happiness of our people and make more available the natural resources with which the state of North Carolina is so abundantly blessed.

Summer rates can be secured from all parts of the state to Morehead City, and the hotel has made a rate of \$2.50 a day to delegates.

Prizes For Photographs of Good and Bad Roads.

Southern Good Roads magazine will award two prizes each month as follows:

1st, \$2.50 to be awarded for the best photograph of a good country road. 2nd, \$2.50 to be awarded for the best photograph of a bad country road, suitable for publication in Southern Good Roads. The idea is to show the best and the worst.

All photographs submitted must be sent flat (not rolled) and no photographs will be returned. They should be legibly marked on the back of the photograph, the title, location and the name and address of the sender. Preference will always be given to photographs reproducing beautiful scenes. The two prize winners will be published in Southern Good Roads each month.

Get busy with your kodak or camera and win these prizes. Address:

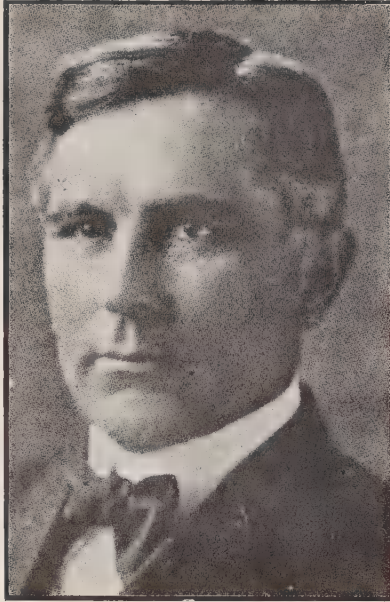
SOUTHERN GOOD ROADS,
Lexington, N. C.

A dispatch from Clarksville, Tennessee, announces that the work of piking the roads of Montgomery county is now on in earnest. The Clarksville Good Roads Club has secured the aid of farmers along the line of the Lafayette road in hauling metal while the county is furnishing the chain gang to grade roads and quarry stone. They have built seven miles, having begun at the Christian county line and came toward Clarksville. Under the same plan of co-operation work will soon begin on the Russellville pike, which is badly worn, and it will be made over.

Second Tour of Inspection Over the Central Highway

Two big good roads events are to be pulled off in the Old North State during the month of July. They are the meeting of the North Carolina Good Roads Association in annual convention at Morehead City on July 30 and the tour of inspection over the Central

all along the line and looks forward to a very pleasant trip. Since the last tour, a great deal of work has been done. The people of the mountains are very much interested in the highway and many townships have voted bonds for building their links of the road and considerable sums have been appropriated by boards of county commissioners and raised by private subscription to further the work. From Asheville another



GOVERNOR LOCKE CRAIG
of North Carolina, who will make a tour of inspection of the
Central Highway this month

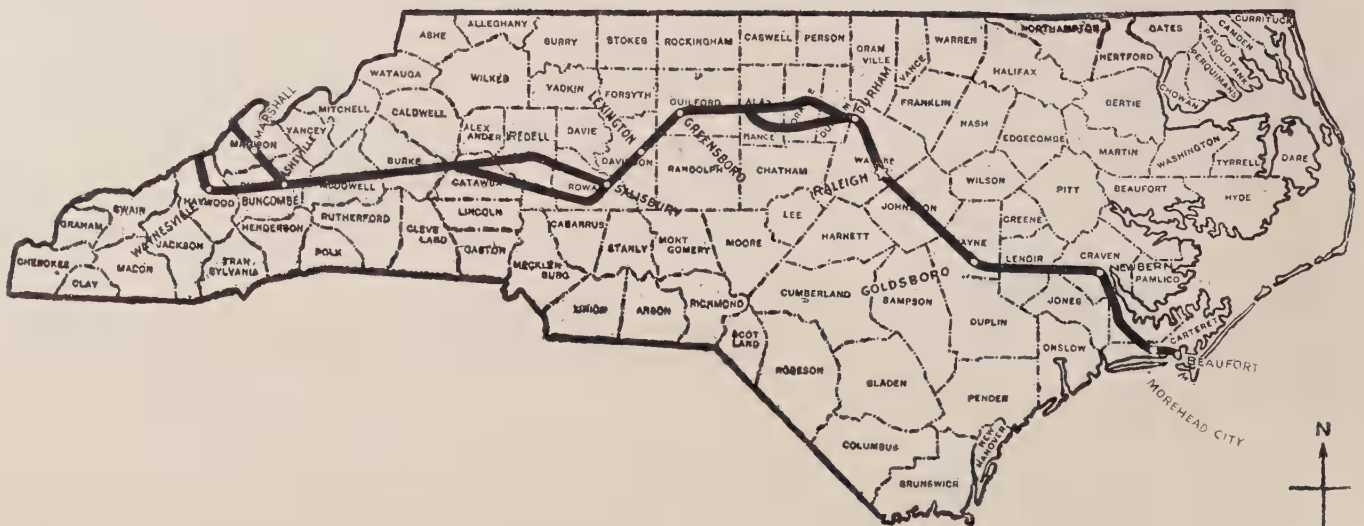
Highway which will end at Morehead City the day before the convention begins. The inspection tour will begin at the Tennessee line in Madison county and end at Morehead City on the first day of the convention. The start will be made on the morning of July 25. Mr. H. B. Varner, of Lexington, who is chairman of the Central Highway's board of directors, will be accompanied on the tour of inspection by Governor Locke Craig and Dr. Joseph Hyde Pratt, state geologist. There will be short stops in the towns and villages through which the highway is to pass.

Mr. Varner has had most encouraging reports from



MR. H. B. VARNER
Chairman Board of Directors Central Highway

branch of the highway is projected, passing by way of Waynesville to Mt. Sterling, at the Tennessee line, and there connecting with the good roads of Cocke county, Tenn. The old route, through Madison county, will be put in condition. Madison county recently provided a bond issue of \$300,000 and the Central Highway will be taken care of from its proceeds. Buncombe county



THE CENTRAL HIGHWAY

Tour of inspection will begin July 25th at the Madison County-Tennessee line and end at Morehead City, on the Atlantic coast. July 30th

roads are in good condition throughout, the Central Highway being no exception. Nebo, Marion and Old Fort townships, in McDowell, have voted bonds aggregating \$85,000 and Old Fort has made application for the \$10,000 offered by the federal government for road-building and has provided \$20,000 to go with it. The road from Ridge Crest to Old Fort is bad but it will be made a model highway. Morganton township, in Burke, has voted bonds for \$50,000 and Hickory and Newton townships in Catawba voted the same amount each. There is a fine bridge across the Catawba, connecting with the wonderful roads of Iredell and it is easy sailing until Davidson county is reached. Here very little has been done. Guilford, Alamance, Orange Wake, Johnston, Wayne, Lenoir, Craven and Carteret present no serious obstacles, though some of the roads of Craven, Lenoir and Carteret are sandy and hard to travel.

The state highway department of Louisiana has contracted for the grading and surfacing with gravel of 14 miles of public road near Baton Rouge.

The commissioners of Miller county, Texas, are considering calling an election to vote on a million dollar bond issue for good roads.

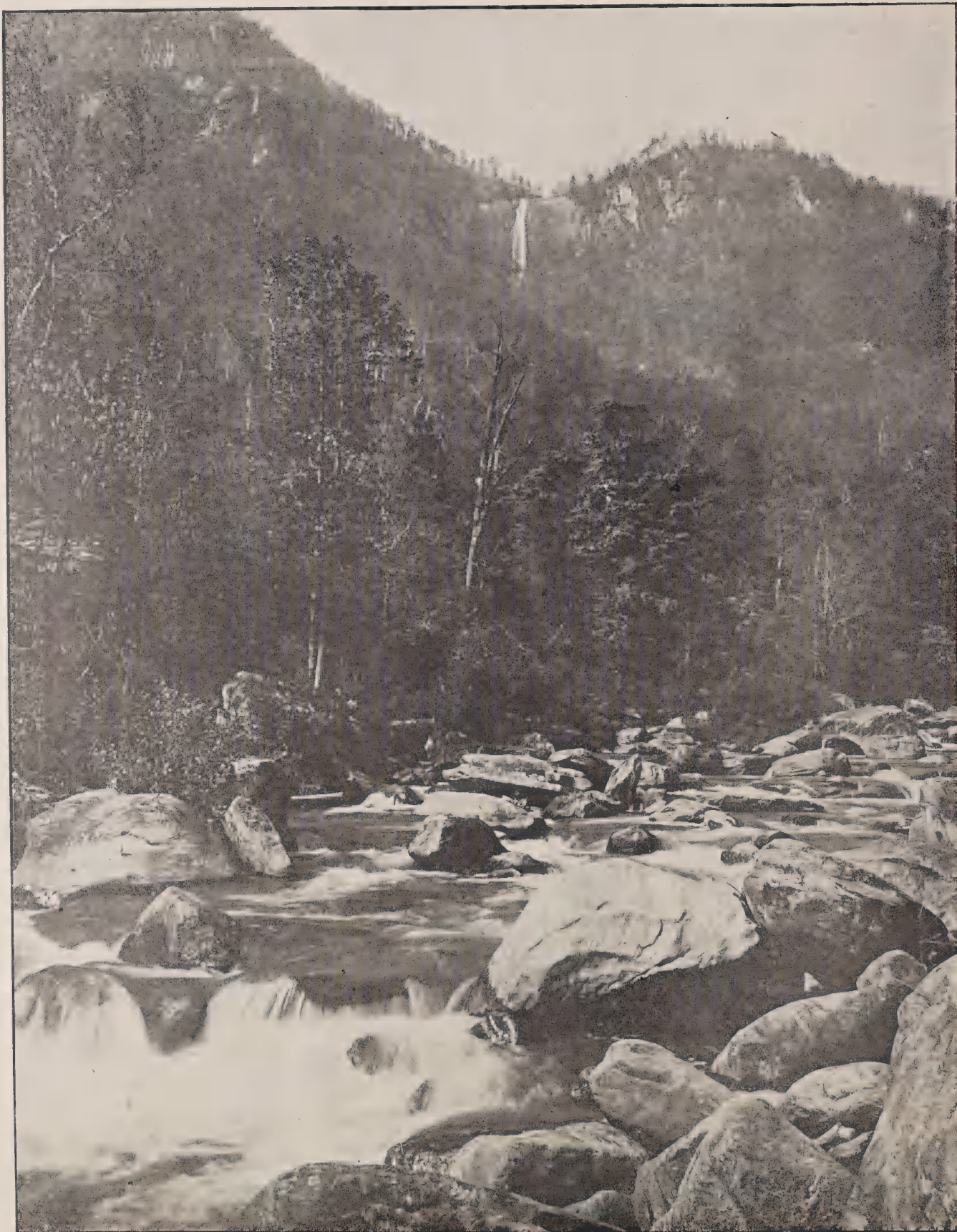
Bad Roads Produce Good Automobiles?

Mr. H. T. Heberle, an automobile dealer of Minneapolis, Minnesota, makes the curious statement that it is American bad roads that should be given credit for the wonderful superiority of the American automobile. He does not believe that the present marvelously efficient car would have been produced without the horrible roads of which motorists complain so bitterly. Using as an example, a tour made by a party of seven, with baggage and equipment, in a big American car, during which Oregon, Washington, California and a large part of Mexico were traversed, he said that throughout the entire trip of about 1,500 miles, over probably as varied road conditions as can be found in the world, this car experienced not the slightest difficulty. A small amount of tire trouble was absolutely all that was encountered. "From what I know of European cars," says he, "I should say that there is none of about the same power and size as this American machine that could have made the trip.

"Now there is coming a reaction in the other direction; and the influence of the motorists is being exerted for good roads. So we have the curious anomaly of the bad roads producing the good automobiles, and now the drivers of the automobiles are demanding good roads."



The beautiful Kenilworth road near Asheville, N. C.



APPALACHIAN FALLS

There is no more wonderful scenery in all the world than that which lies along the great highways that are being driven through the mountains of Western North Carolina. This is a view of Appalachian Falls, 960 feet high, from the Asheville-Charlotte Highway which runs through Hickorynut Gap

Who's Who in Highwaydom

One of the younger members of the last legislature of North Carolina, and one who probably accomplished more legislation for county betterment, the result of which will really be state-wide, is James E. Rector of Madison county, North Carolina. Mr. Rector is the author of the Madison County Highway Commission Bill, enabling Madison county commissioners to issue \$300,000 worth of bonds for a system of roads in Madison county. He also prepared and secured the passage of a bill to construct a part of the Central Highway through Madison county with state convicts, to replace the former state road now used by the Southern Railway as a roadbed. This section of the Central



HON. J. E. RECTOR

Representative from Madison County, North Carolina in the General Assembly

Highway in Madison county will be one of the best roads in the state and runs along the beautiful French Broad River with great mountains on either side, forming scenes of unusual magnificence and splendor. This link of the Central Highway will be essentially a state road, as it is the connecting link between the splendid roads of Buncombe county and the state of Tennessee.

Mr. Rector was born December 21, 1882, near Morristown, Tenn., the son of A. J. Rector and Mary Perkins Rector. They moved to Madison county when he was a small child and have lived there ever since. He attended the free schools of the county as a child, and then the Dorland Institute of Hot Springs, and Tusculum College, but did not complete the course in the latter institution. He studied law under James J. Britt, former third assistant postmaster general, stood the state examination and was admitted to the Bar February 1, 1909.

He was candidate in the republican primaries 1910 for nomination for representative but was defeated by J. Coleman Ramsey, who was elected in the general election following. He defeated J. Will Roberts for nomination in the republican primary 1912 and won in

the general election over N. B. McDevitt, the Madison county representative and the democratic candidate, in what was probably the hardest fought campaign ever waged in that county, winning against a combination of the democratic party and the republican machine. Mr. Rector being the people's choice.

His work in this legislature will live as a monument to his worth and effort on behalf of the people of his county. He maintains an office both at Hot Springs and at Asheville, in which latter place he is the attorney for the Merchants' Association.

Good Roads Conventions Coming.

American Road Congress, Detroit, Michigan, Sept. 29th, to Oct. 4, 1913.

North Carolina Good Roads Association, Morehead City, N. C., July 30 to August 1.

To Pave or Not to Pave.

To pave, or not to pave; that is the question:
Whether 'tis nobler through life to suffer
The delays and breakdowns of outrageous roads,
Or to take arms against a sea of mudholes,
And by paving, end them? To pave,—to pave with
brick,—
Not mud; and with these bricks to say we end
The ruts and the thousands natural ponds
That our roads are heir to,—'tis a consummation
Devoutly to be wish'd. To pave,—to pave with
brick!—
To pave with brick! Perchance to pay! Ay, there's
the rub;
For in that tax on highways, what payments may
come,
When we have covered o'er these muddy ruts,
Must give us pause. There's the respect
That makes calamity of so many roads;

For who would bear the shock and jar of travel,
The trip's delay, the city man's contumely,
The pangs of lonely life, the markets miss'd,
The loaded wagons broken, and the spurns
That patient farmers of the progressive take,
When he himself might his pavement make
With a few thousand brick? Who would these troubles
bear,

To grunt and sweat under a weary life,
But that the dread of something after paving,
The unknown tax from whose burden
No tax payer escapes, puzzles the will,
And makes us rather suffer those ills we have
Than fly to others that we know not of?

Thus the cost does make cowards of us all;
And thus the native hue of resolution
Is sicklied o'er with the pale cast of thought,
And pavements of great length and worth
With this regard are left unlaid,
And lose the people millions.

—W. D. P. W.

Reprint from The Clay-Worker, May, 1913.

It is announced that the department of public roads of Kentucky now has plans ready for 22 new bridges and many culverts in all parts of the state.

The commissioners of St. John county, Florida, will contribute liberally to the fund being raised for the construction of a bridge across San Sebastian river, connecting St. Augustine and New Augustine. The bridge will be of concrete.

Road-Building, Road-Boosting and Road-Boosters Throughout the Nation

Secretary Roberts, of the Chamber of Commerce, Gadsden, Alabama, has invited the Alabama Good Roads Association and the good roads enthusiasts of Birmingham and Chattanooga to hold a meeting in Gadsden soon. The association and the chambers of commerce of Chattanooga and Birmingham and the Chattanooga Times are arranging a big scout tour between the two cities and a convention somewhere between them. He suggests Gadsden as the most desirable intermediate point and has already sent out an invitation to that effect.

* * *

Hon. Richard H. Edmonds, editor of the Manufacturers' Record, Baltimore, made a trip through the south-west in May and June lasting six weeks. He was studying the general business and industrial outlook and on his return spoke very optimistically of conditions he had observed.

"Everywhere throughout the south and southwest," said Mr. Edmonds, "road building is the order of the day. Radiating from Chattanooga, for instance, there are about 250 miles of good roads, and now a boulevard, and in connection therewith a double-track electric line, projected by men of large wealth, is planned between Chattanooga and Louisville, a distance of 210 miles."

* * *

Recently in a western town of 2,500 people thirty merchants offered prizes in merchandise and money aggregating \$2,000 to farmers who would come to town on a certain day on road drags, says the Springfield News.

Before evening of the day designated, the arrival of 150 drags had been registered. The one coming the farthest was brought by a girl of twenty who drove thirty-one miles, getting up at 2 o'clock. A married woman with a seven months old baby drove fourteen miles. One farmer who came in on a drag was seventy-five years old; another drag was brought in by a little girl of mine.

Coming and going the 15 prize winners traveled an aggregate of 1,754 miles.

Of course many of them covered the same road, but the result of the experiment was to put over 100 miles of road in excellent condition.

* * *

The Donley County Good Roads Association has been organized at Hedley, Texas. The club is an auxiliary to the Panhandle division of Colorado-to-the-Gulf Highway Association. Judge J. C. Killough of Clarendon was elected president. The county commissioners were elected honorary members.

* * *

The Texas Good Roads Association will have a mid-summer congress at Corpus Christi, Texas, July 10, 11 and 12. L. W. Page, Director of the Bureau of Public Roads and other men of national reputation will be present, and the hope is to make this the greatest gathering of good roads enthusiasts that has ever been held in the south.

The association has invited the commercial organizations, the mayors of cities and county judges of Texas to appoint delegates to attend this congress, and

urges all who are interested in the improvement of the public highways of Texas to co-operate in making this meeting a great success.

Corpus Christi offers many attractions to visitors and in addition to attending the good roads congress, the event can be utilized very pleasantly in taking a vacation.

J. W. Warren of San Antonio is president of the state association and Homer D. Wade of Stamford is secretary.

* * *

The city council, on the Texas side of Texarkana, has ordered an election for June 30 to pass upon two proposed bond issues. One is for \$225,000 to be used for permanent street and bridge improvements and the other for \$60,000 to be used in extending and improving the city's present sewerage system.

* * *

Arthur H. Blanchard, M. Am. Soc. C. E., Professor of Highway Engineering in Columbia University, sailed on June 12th to attend the Third International Road Congress, London. Professor Blanchard is a United States reporter on Question 3, "Construction of Macadamized Roads Bounded with Tarry, Bituminous or Asphaltic Materials," and Communication 10, "Terminology Adopted or to be Adopted in Each Country Relating to Road Construction and Maintenance." He has been appointed a delegate to the Congress by Columbia University, the American Society of Civil Engineers, the National Highway Association and the American Road Builders' Association.

* * *

At a meeting of the board of magistrates of Craven county, North Carolina, held last month at New Bern, the county seat, in connection with the monthly meeting of the board of county commissioners, they decided to increase the levy on the road tax from fifteen to twenty cents. During the past few months the citizens of Craven county have awakened to the advantages of good roads and have already spent thousands of dollars on improving the county highways and several thousand dollars will be spent during the next few months. The services of R. E. Snowden, of Snowden, N. C., an expert road builder have been secured and he is superintending the construction of a number of new roads.

STATEMENT.

of the Ownership, Management, Circulation, Etc., of Southern Good Roads, published monthly at Lexington, N. C., required by the act of Aug. 24, 1912:

Editor—H. B. Varner.

Managing Editor—H. B. Varner.

Business Manager—Fred O. Sink.

Publishers—Southern Good Roads Publishing Co.

Owners—H. B. Varner, Florence C. Varner, Fred

O. Sink, G. W. Johnson.

(Signed.)

FRED O. SINK,

Bus. Mgr.

Sworn to and subscribed before me this 5th day of April, 1913.

W. H. MENDENHALL, Notary Public.

GOOD ROADS NOTES IN BRIEF

Bartow county, Georgia, is asking for bids on a big bridge across Euharlee creek, near Stilesboro.

The city of Columbus, Georgia, has voted \$40,000 of bonds to complete a concrete bridge.

Lee county, Mississippi, will construct a steel bridge one mile from Tupelo.

Madison county, Kentucky, is asking for bids on three fine bridges.

Baltimore county, Maryland, is asking for bids on a concrete bridge across Graves Run on the Falls road.

The commissioners of Haskell county, Oklahoma, contemplate issuing bonds for \$60,000 to build a system of bridges throughout the county. Thirty-seven bridges are planned, one across San Bois river being the most expensive. It is estimated that it will cost \$8,000.

Mecklenburg county, North Carolina, will construct a bridge across Long creek, 252 feet long. Bids are being asked for. The county will furnish the materials and the bridge will be built under the supervision of an engineer.

The town of Graham, North Carolina, has voted \$50,000 of bonds for street work.

Wake county, North Carolina, may vote on a bond issue of \$1,000,000 for road-building. The matter of calling an election has not been definitely decided on. The last legislature passed an act authorizing such an election.

The commissioners of St. John county, Florida, have authority, from the governor to issue county warrants for \$70,000 to provide for permanent road construction. It is proposed to spend a large part of this amount in laying three miles of paving with vitrified brick center and shelled sides.

The Salisbury, North Carolina, Industrial Club conducted an automobile tour last month from Salisbury to Whitney, Stanly county, with a view of mapping out a highway connecting the two places. It is proposed to build a first-class macadam road.

The town council of Breau Bridge, Louisiana, voted last month to increase town taxes sufficiently to raise \$60,000 for street improvement.

In Cumberland county, Virginia, last month Clintwood magisterial district voted bonds for \$44,000 for road work.

Grant magisterial district, Wetzel county, West Virginia, will vote July 15 on a bond issue of \$150,000 for road building.

The city of Baltimore, Maryland, has contracted for a large amount of street paving. Part of it will be of concrete, with a bituminous cover and the remainder vitrified brick.

District No. 4, Limestone county, Texas, will build 70 miles of macadam roads. The county commissioners are asking for bids.

News comes from Kansas City that Jackson county, Missouri, will add 14 miles of high class road to its already large mileage of first-class highways.

Webb county, Texas, has decided to spend \$25,000 in the building of a road from Laredo to the county line, a distance of 37 miles.

In Smyth county, Virginia, contracts have been let for 20 miles of macadam road in Marion district and 27 miles of macadam and 30 miles of grading in St. Clair district.

Baltimore county, Maryland, will widen to 106 feet and greatly improve the road to Roland Park at an estimated cost of \$70,000.

This wonderful bit of scenery known as Bailly's Bend is in Madison County and is on the line of the Central Highway and the Southern National Highway



GOOD ROADS NOTES

GATHERED HERE *and* THERE

Alabama.

Members of the Alabama State Highway Commission, accompanied by Mr. W. S. Keller, state highway engineer, have just completed a 1500-mile tour of the state for the purpose of mapping out a system of state highways. The Highway Commission used a new Buick automobile and Mr. J. H. Barr was the chauffeur.

The tour began at Mobile. Accompanying W. S. Keller was John Craft a member of the Highway Commission and president of the Alabama Good Roads Association. They left Mobile Monday morning and went through a portion of Mobile and Washington counties. Crossed the Bigbee river on the ferry and put up at Thomasville the first night. The citizens received them and the board of trade held a public reception. They left Thomasville next morning and were escorted by members of the Commercial Club to the Wilcox county line.

From Pinehill to Catherine, owing to the bad roads due to heavy rain and the heavy waxy lands it took them four and one half hours to make 20 miles to the adjoining county of Dallas.

From Hazen to Selma a distance of fifteen miles, where clay and gravel roads are being built by convicts, the run was made in 19 minutes. The Chamber of Commerce of Dallas entertained the party and much enthusiasm was shown by the business men. They were given a smoker and president Craft and State Highway Engineer Keller addressed the merchants. They left Selma next day at 9 o'clock and were escorted to the county line by representatives of the Selma Chamber of Commerce.

At Lowndeshoro they were entertained by the citizens. Leaving Lowndeshoro they arrived at Montgomery at 5:30 in the evening. Next morning they left Montgomery, going through Montgomery, Autauga, Chilton, Shelby and Jefferson counties.

At Birmingham they stopped at the convict camp where the convicts were put on the roads about two weeks ago. The convicts have fine sleeping quarters and wholesome food, and are doing fine work in cutting down the grades. They are building a fine road connecting with Shelby county.

* * *

Arkansas.

The state of Arkansas seems to be enthusiastically in favor of the Southern National Highway and Col. Dell M. Potter, of Arizona, president of the Southern National Highway Association, who has been working up enthusiasm in Arkansas, has been received with open arms everywhere. There was a big reception in his honor at Hotel Marion in Little Rock and much speech-making, all of it of the highest order.

The chief address of the meeting was made by Mr. Potter, who spoke of the purpose of the Southern National Highway Association, and explained the benefits each state would receive. Among the other speakers were W. R. Smith, representing the Little Rock Auto Club; Judge Joe Asher, on behalf of the county; R. E. Wait, on behalf of the bankers; President J. D. Arnold, president of the Chamber of Commerce, and a number of other prominent men of Little Rock.

In Hot Springs, Arkansas and other towns, Mr.

Potter was received with equal enthusiasm. Mr. E. A. Kingsley, state highway engineer, accompanied him in his journeys and took great interest in the work. Colonel Potter attended the first meeting of the State Highway Commission of Arkansas and watched its organization. The commission is composed of Reuben G. Dye, Chairman, C. W. Highfill and A. S. Kilgore. Colonel Potter made a speech to the commission, outlining the plans for the Southern National Highway, and was heard with close attention.

* * *

Florida.

Despite the pressure that was brought to bear upon them, Florida's legislators defeated the state highway commission bill last month by a vote of 31 to 32. The indignation of the people is expressed forcibly but rather fancifully by the Jacksonville Metropolis in the following:

The State Highway Commission bill has been slaughtered, and its remains flung out on the sandy roadways of the state to be gazed on by every passing eye. Many a Brutus thrust was given as they cried, "Hail, Caesar!"

Cried for by the coming generations of the State, urged by the wisest heads of the present day all over Florida, endorsed by the Boards of Trade of almost every city in the state, and drafted by the State Good Roads Association, a body of progressive, patriotic citizens, after which it was approved by every intelligent man who knew of the bill, the so-called wiseacres of Tallahassee set their judgment up against all the rest and killed it.

By their action they have crippled progress and improvement in the state for at least two years. What has been the reason for their act the public does not know. Perhaps, like Brutus, they will bear the body to the public square and tell the people why this bill deserved death; but we fear for them lest a Mark Antony arise and turn the populace on them to their everlasting elimination from the field of politics.

The Metropolis can hardly express its feeling of indignation that the men whom the people sent to represent them should, a majority of them, have done this deed. The names of those responsible for this outrage should be blazoned in letters of flame, so that Florida may never forget their arbitrary and unreasonable act.

* * *

Illinois.

The report of the Illinois Highway Commission for the years 1910, 1911 and 1912 is now in the hands of the binder and will be ready for distribution in a short time. The report covering 361 pages and profusely illustrated describes in detail the many lines of work undertaken by the Highway Commission during the last three years.

There are chapters on the "organization of township work" "distribution of crushed stone prepared by convict labor," a complete report from year to year of each of the 15 pieces of machinery of various kinds that have been constructed by the State Commission, practical instruction in the making of macadam and concrete roads, a large amount of detailed cost data of

roads built by all parts of the state, results of the road traffic census, a discussion of the bridges constructed according to the modern requirements, and a fine chapter on roadside planting.

The report is filled with information of great value to people in all parts of the state and a large number of illustrations make it attractive to the casual reader.

* * *

Texas.

The Colorado-to-Gulf Highway Association met at Childress, Texas, in June and a decided impetus was given the project. The meeting was well attended and several important actions were taken, among them being the decision to assess every county through which the highway passes, \$100 for logging the route, except in those counties where an official log has already been made.

Admission to the association was granted Dalham county through M. D. Waggoner, of Dalhart, who explained that the county had been working on the line from Texline to Amarillo and that a little more work would make it an almost perfect automobile highway. Mr. Waggoner also said that Dalhart would see that Hartley and Moore counties did their part in the work.

President O. L. Williams called for reports from the counties as to what progress had been made in organization. Mr. Williams reported that Clay, Wise and Tarrant counties had already been organized and would join heartily in the movement.

Seth B. Holman of Amarillo reported Potter county organized and ready for business; E. J. Slay reported Armstrong county organized and roads in good condition; G. A. Wimberly reported Donley county thoroughly organized; W. P. Dial reported Hall county organized. J. H. Aynesworth reported Childress county organization perfected, with splendid progress in good roads work, and pledged hearty support to the association. Hardeman county organization was reported by Ben J. Brothers with about 200 members who were ready to put up the Hardeman county assessment in the association. Wilbarger county reported organization, while D. P. Talley sent a telegram stating that Wichita county was to co-operate in the work.

Clarendon was selected as the next meeting place, July 25, over Vernon.

Every county in the State of Texas where good roads are needed, and it is probable that every county in Texas could improve its roads system, is vitally interested in the special election to be held throughout the state on Saturday July 19.

At that time an amendment to the constitution will be submitted which seeks to permit a majority vote instead of a two-thirds vote on good roads bond issues as at present.

By the majority plan a handicap of considerable voting strength is removed, for the majority in a progressive community is usually favorable to progressive ideas and are willing to spend money to promote busi-

ness. They are imbued with the idea that a dollar not working depreciates in value to zero.

All sections of the state are seeking to get out an immense vote and practically every newspaper, commercial club and the progressives of each community are urging the voters not to overlook this opportunity to increase the business possibilities of the state.

* * *

Tennessee.

There has long been demand for a highway between Chattanooga and Knoxville and a monster good roads meeting attended by over 15,000 citizens of McMinn, Monroe, London and Bradley counties as well as large delegations from Chattanooga and Knoxville who will go in automobiles and on special and regular trains to Athens, July 4, will be the first gun fired in the campaign for it.

The good roads meeting will be held in connection with the Fourth of July celebration planned by the business men of Athens. Prominent good roads speakers will be arranged for by the Chattanooga junior and senior chamber of commerce, the Athens board of trade and the Knoxville board of commerce.

The Commissioners' Court of Neuces county, Texas, has called an election to vote bonds in the sum of \$750,000. Of this sum \$500,000 is for good roads and \$250,000 for a new courthouse and jail.

Public roads leading into a city are like the roots of a tree which go out in many directions gathering the moisture from the soil to give life to the whole tree. So it is with the public roads which reach from our cities. They are indication of life and prosperity to a city. The more sources of approach, the more prosperous is that city. There would be no quicker way of destroying a city than to isolate it—cut it off from outside communication.

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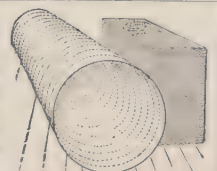


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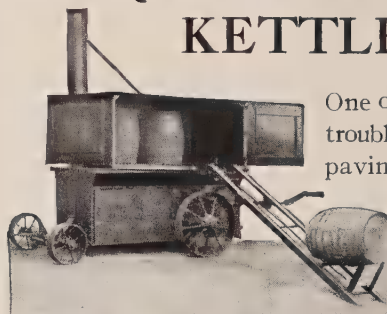
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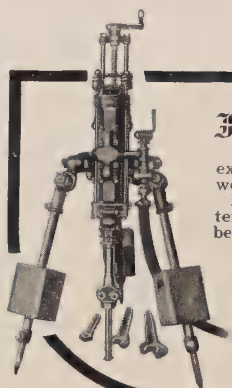
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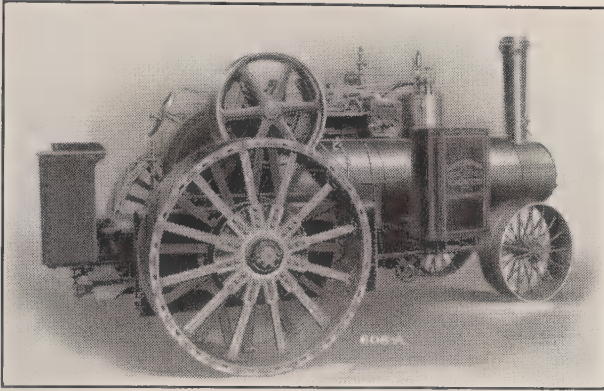
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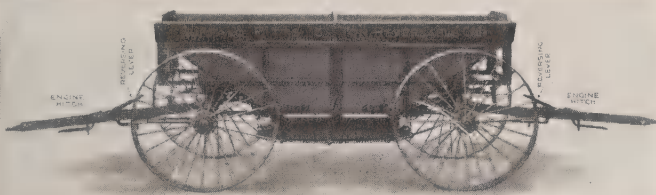
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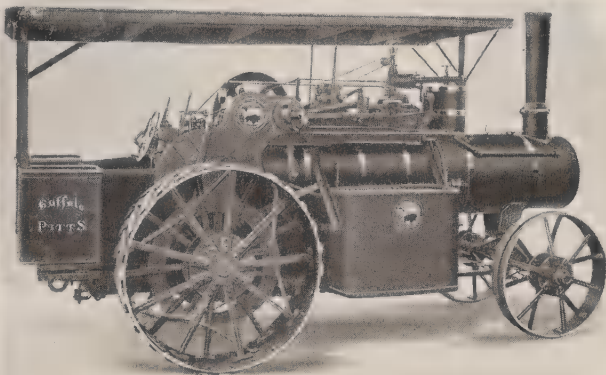
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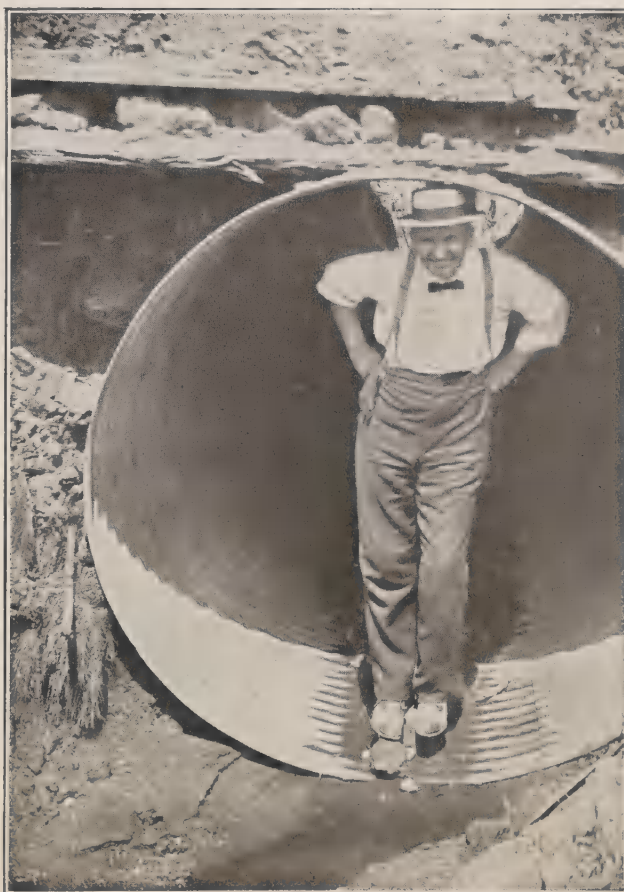
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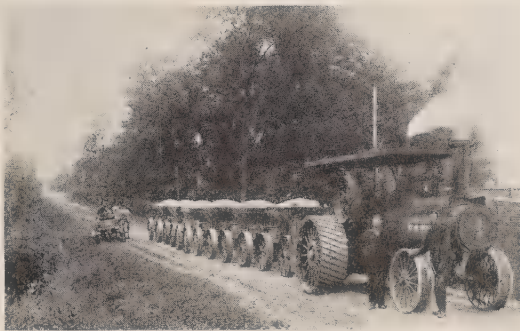
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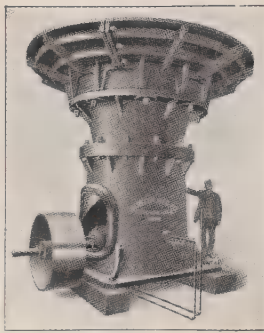
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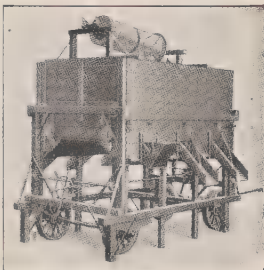
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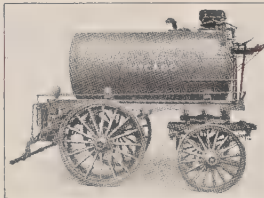
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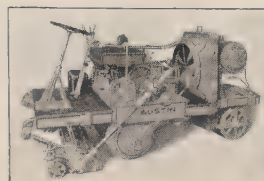
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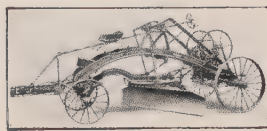
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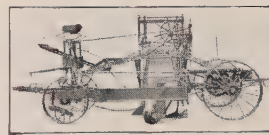
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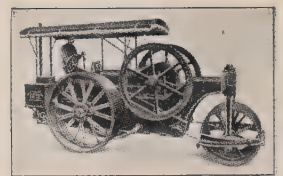
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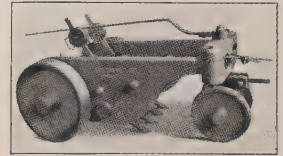
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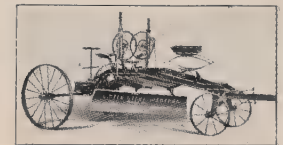
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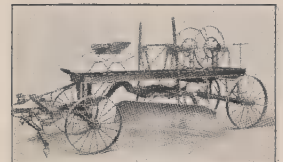
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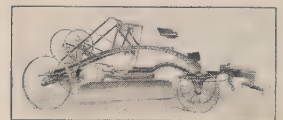
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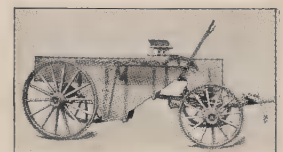
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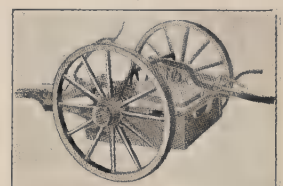
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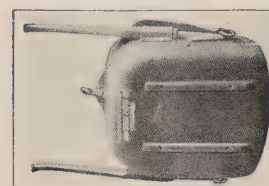
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Drag Scraper

SOUTHERN GOOD ROADS

Vol. VIII. No. 2.

Lexington, N. C., August, 1913

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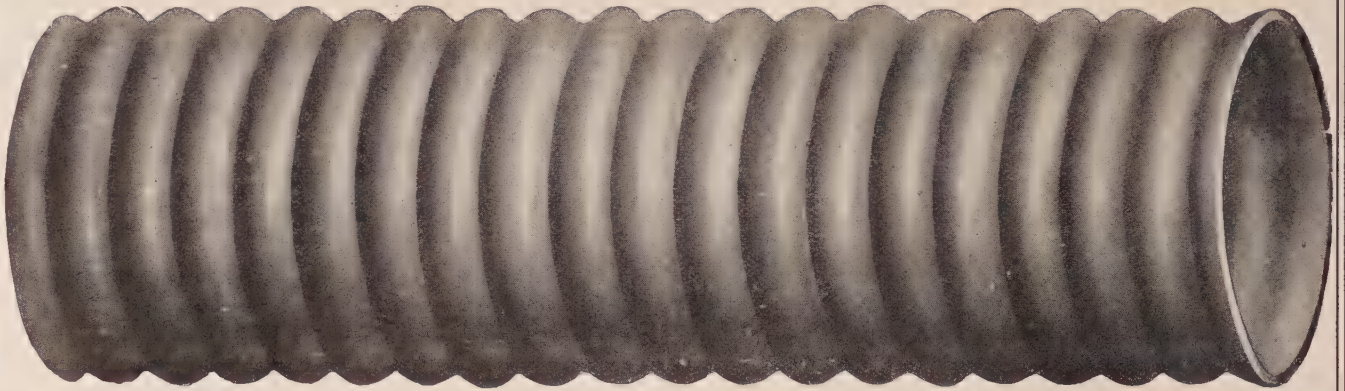
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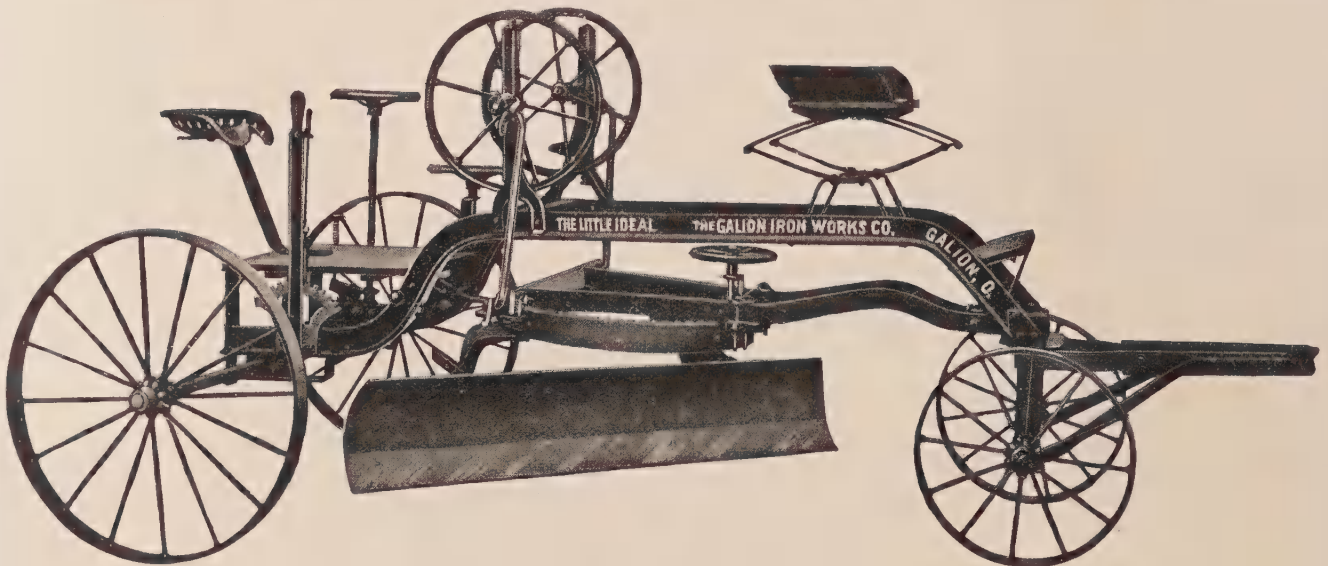
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Road Management

By LAURENCE I. HEWES, Ph. D.

Chief of Economics and Maintenance, U. S. Office of Public Roads

UP TO the year 1892 road management in the United States was entirely in the hands of the local authorities in counties, districts and towns. In 1892 New Jersey inaugurated a state highway plan and Massachusetts followed the next year. There are now 23 states which have active state highway organizations. In some of these states, state roads and State Aid roads are built and maintained by the state. In other states when state aid roads are built they are maintained by local authorities and in several states the state organization does no road building but furnishes advice and assistance to the local authorities. In the state of New York alone there has been a complete reorganization of the management of all the highways within its borders. The roads of this state are subdivided into four classes; (1) state, (2) county roads improved with state assistance, (3) other county roads, and (4) town roads; the influence and authority of the state extends, to some extent, to each class.

The prevailing type of road management is still that which is determined and operated by county and town. The expenditure under such management in 1909 is estimated to exceed \$100,000,000. The total number of petty officials such as road supervisors, overseers, road-masters and others has never been accurately determined. In some states, including county officers, there are more than 15,000. It is safe to say that there are in the country at least 150,000 local road officials so that the average appropriation handled by each such official is less than \$700 including his own salary.

Consider then the typical local administration for highway purposes. Under the county organization the county commissioners or county supervisors number from three to five. They usually have general authority over the road fund and appoint deputies (supervisors, superintendents or overseers) to supervise the expenditure of the money allotted to the several districts. In many instances these deputies are not appointed by the county commissioners but are elected by the people. In any case their term of office is short. The county engineer or the county road supervisor is found in but a small percentage of the 2,900 counties. In states where the civil subdivision is the town or township, the selectmen, usually three in number, control the road fund and the work is done by their deputies, who may be appointed by them or elected by the people. In rare instances there is a town engineer. In other

cases the county engineer may be called upon for advice and assistance; usually he has no authority.

The bases of local road management is therefore political; that is to say, the men selected for highway management and highway construction, repair, and maintenance, may be and usually are selected for reasons other than their special fitness for highway work. The majority of communities are not conscious of their defective road management. It is not generally understood that road work requires special training. The men who are chosen as county commissioners or as selectmen to levy taxes and handle public money, are usually conservative, careful guardians of the treasury. Their conspicuous defect is the lack of positive knowledge of road administration and their consequent clumsy attempt at economical expenditure. They are controlled and limited by precedents and past history and their entire experience has been gained from one town or one county. They are compelled in the absence of sound training to depend upon the shrewd subdivision of the road fund to remain in office.

The men who carry out the orders of the county or town administration, that is to say, the men who actually supervise the road jobs, work at great disadvantage. They are usually paid per diem wages and set to a task which requires expert knowledge. Their common complaint is "If we had the money, we could build you good roads."

Seldom it is that a road supervisor seeks advice. He gets his training while in office in the pay of the community. Unfortunately by the time he has learned that no one method will apply to all conditions and that road making is an art which he must patiently study, he is replaced by a new incumbent and the process is repeated.

As a specific illustration, consider a country earth road in bad repair. The horse track in the travelled way is lower than the wheel track. Wheel tracks are interrupted by chuck holes or depressions in which waters stand after storms and in which black mud is present between storms. Outside the wheel tracks the shoulders of the road are high; sod encroaches on the roadway and weeds and bushes occupy a strip of several feet between the edge of the travelled way and the original side ditch or gutter. In many places cobble stones thrust themselves above the road surface, water breaks have occurred at bends of the road and in

places the roadway has suffered from wash and erosion until it is dangerous for travel. There is allotted for repair of this road a sum of money which the supervisor knows is small. Something must be done. When the road grading machine with from four to eight horses arrives, it is at once apparent that to remove the bushes and weeds and then to scrape the sod entirely away between the two gutter lines or side drains will be impossible. So the road supervisor operates the grader to remove the sod strip from one to two feet wide next to the traveled way. After several round trips this sod and other organic matter and waste material has been worked into the center of the road and two gutters have been formed. The road supervisor does not realize that these two gutters close into the traveled way are what are known as the deadly secondary gutters. They do not drain the road, they are almost never true to grade and they are too close to the wheel tracks. He is equally ignorant that the sod and rotted leaves and other refuse which have been scraped up from the edge of the roadway can under no circumstance ever form a hard, smooth traveled way. As a matter of fact, such material on the road constitutes a nasty bed to soak up rain water and effectively prevents surface drainage.

The road money has been spent.

The important matter for us to decide in discussing road management is this: Shall we continue to do our road work without effective organization? There is ample knowledge available today as to the proper methods of construction, repair and maintenance of highways. The next great step in general highway betterment depends upon better road management. How can that management be developed? I hope to point out to you several points in which improvement of road management can and must take place. In the first place, we must no longer regard road matters in

a casual way. We must stop thinking of the roads and their upkeep as mere incidents in the operation of our local government. To obtain a successful highway system will require serious effort. The second point which we must realize is the necessity of special training in highway work. The community can afford to pay for trained highway engineers and roadmen but it cannot afford the repeated expense of partial training for its supervisors only to abandon them at the next election. The third point is to realize that road management like any successful business, (and road management is a business) requires an executive head. Not only is a one man authority desirable in order to fix the responsibility and justify an adequate salary but there must be leadership and incentive and leadership and incentive cannot be present where authority is multiplied and experience lacking. The fourth point which I wish to make, concerns the period necessary for developing good roads. It is a common error to expect reform too quickly. Road work must be undertaken with the idea of continuous management over a period of years and this brings me to the fifth point: Why is it that we expect success in road management without a definite plan of the work. There should be adopted a comprehensive scheme of road improvement based upon existing conditions. To be more specific, we must determine what roads we have, eliminate some if need be, subdivide the others into suitable classes and plot them on a map. We must go back over the records of road appropriations and determine a financial plan for future work. I am speaking now of the county unit or of civil subdivisions of the county.

The executive head for a county road system should be a civil engineer with highway training or, if you please, a highway engineer. There is an increasing demand for such men and there is a visible willingness



A piece of macadam road near Charlottesville, Va. Coal tar was used as a binder and the road is standing up well under the traffic

to pay them adequate salaries. It has been found, especially by those counties which have issued bonds (sometimes for as much as \$1,000,000), that it is not economy to spend money for road work without adequate engineering advice and service. The trained highway engineer can bring to bear upon the problems in a given county the knowledge gained of soil topography and road material under varying conditions. He understands why a method which has worked well in one place will not be applicable to all conditions. There is no question that county road work is best managed by one responsible man. It is ridiculous, however, to suppose that a county engineer or county road superintendent can give personal attention to all the miles of a county road net-work in every instance. A certain county in Virginia employed a road superintendent to care for 1200 miles of highway, so that if he could personally inspect four miles a day, his entire time would be occupied in going over the system once each year. The county highway engineer should be responsible to the county officials for the management of the county road system but he should be given enough assistance to do his work.

The order of procedure then in building up effective road management in a local community requires an examination and classification of the roads and the appointment of an executive who should be a highway engineer. Following this step, abolish statute labor, and the financial plan for a series of years should be then determined. It is not, however, necessary to start highway management in all cases by raising more money. In fact, if a community contemplates an issue of bonds for improving its roads, it is highly desirable that the effective management be well under way before the money is raised. The classification of the roads should sub-divide the road net-work into at least three classes based upon their service to the public. In the first class may be placed all roads which form direct connection between the more important cities and towns in the county or other similar units. These are through roads and should be selected with a full understanding as to the part they may be called upon to play as connecting links of through roads between counties or larger units. Through roads have become of increasing importance with automobile traffic and their desirability and advantage can no longer be ignored. The second class of roads should be the main market roads of the community, namely, those roads which lead to the shipping points on railroad lines and to the local markets of towns or cities. It is inevitable that this second class of roads will include roads of the first class. The third class of roads will include roads of the first class. The third class of roads should be the residual roads in the community which are largely neighborhood roads or roads which serve a restricted number of people. A proper selection of roads to be first improved should include those market roads which are also through roads or portions of trunk lines. All of such roads cannot, however, be improved before the market road system receives its share of attention. Neighborhood roads in the beginning, in an area of new construction should be repaired and gradually brought under systematic maintenance. It will take some time before a sound financial plan can be laid down which will insure the best system of roads which the country can afford to build and maintain. The different classes of roads may be designated on the county map or the community road map in different colors and provision should also be made to indicate their existing condition, as gravel, earth or macadam, etc., at the time the map is made. It

is commonly found that there is an excessive mileage of roads and it may be necessary to frankly eliminate some roads at the outset by bringing about sufficient improvement in parallel roads to justify the elimination. The county engineer must know what is to be done on the entire system of roads and how and when the work should be finished. He will require competent deputies to carry out his instructions and he must be allowed sufficient office expenses to make surveys and to run his office.

Under good road management, there should be prepared for each subdivision of the road unit, whether county or district, accurate estimates of the necessary



Gravel road, on bad up-hill grade, near Hyattsville, Maryland, that has gone to pieces for lack of attention and on account of bad construction

expenditures for the coming year. Such estimates should be submitted to the highway engineer by his deputies and after approval submitted to the county commissioners or district supervisors or town selectmen, for final approval. Not one dollar of money need be expended without full knowledge of the necessity and desirability of its use.

There will be in each community some roads machinery and tools owned by the community. Proper provision must be made for housing the machinery and keeping it in proper repair and providing additions when necessary. During the winter months, machinery and tools must be overhauled, repaired and painted. Highway bridges should be carefully indicated on the road map and there should be a list of such bridges

and major culverts showing their form of construction, kind of material, dimensions, cost, condition, and the total expenditures for repairs, if possible. The entire road management must be directed toward the gradual development of the road system. To this end, some new construction must be carried out each year. Old culverts and bridges can be gradually replaced by modern permanent structures according to a definite order which must be carefully thought out and planned.

A conspicuous defect in local road management has been the lack of proper bookkeeping. No money should be expended without a warrant and a voucher and all expenditures should be carefully prorated on the different items of work. For this purpose, a distributing table may be printed on the back of the warrant or some equivalent device adopted. For intelligent road management, it is positively necessary to develop accurate unit cost of all classes of work. At the end of a few years, the highway engineer must be in position to know exactly the cost in his community of earth excavations, rock excavations, gravel, broken stone, concrete, etc.

Before actual construction or repair is begun, the exact location of all sources of road stone, gravel and sand should be indicated on the highway map. The engineer must make it his business to thoroughly prospect the county or road district for supplies of stone

and other material and unless the quality of material is well established, tests should be made to determine its value. It should be determined in each instance whether or not a central crushing plant owned by the county or towns is desirable or whether it is better to install semi-portable crushers at different points on the road system.

In carrying out the work of construction, repair and maintenance, there are many details on which a careful man can economize. The balance of laborers and teams in hauling material and the speaking of teams coming on to the work are important matters on every job. When work is to cost over \$500, it is an excellent plan to let it by contract.

The importance of maintenance in any scheme of road management cannot be over emphasized. The success of any road plan depends upon effective upkeep of the roads. After a road is once put into repair, continuous maintenance must be provided. For this purpose, the road patrol is the best plan. The road patrol or roadman or patrolman as he is sometimes called is paid to care for a certain definite mileage of highways. Either he must be continually on the road or he must be hired to do what work is necessary at the proper time. In either case, the patrolman is responsible for the upkeep of his road section. He must care for the drainage at all times and must drag the roads which are built of earth or gravel and consistently repair



On the Crest of the Blue Ridge Highway in Mitchell county, North Carolina

small damages. It is probable that the moneys saved in serious repairs by the presence of the road patrol continuously will justify his salary. Particularly is this true on earth roads subject to heavy rainfall and violent storms.

In New York, the State Highway Department has recognized the necessity for adequate road management on all roads. Within the state, at the present time, are over three thousand miles of state and county highways which will be under the exclusive management and maintenance by the state for the present year. These roads are for the most part ordinary macadam roads of which a large mileage has recently been treated with bituminous material. The maintenance department of state roads consists of six divisions embracing the 57 counties of the state. Each division has a superintendent of repairs and a complete patrol has been established. Of the remaining 77,000 miles of roads within the state, 3,000 miles are macadam town roads, 8,000 miles gravel town roads, 40,000 miles are earth roads which have been shaped and 26,000 miles remain in their original condition. This vast system of 77,000 miles constitute what are known as the town highways. They are in charge of the town highway bureau. During the fiscal year, 1911, the total expenditure upon town highways was \$8,800,000 including \$2,000,000 contributed as state aid by the state. The money raised by the several towns together with the state aid money is in the custody of the local officials. The first step in raising money is an estimate required by law on or before the 31st of October of each year. All highway money is under the constant supervision of the State Highway Commission and assistance and direction is given to the town officers by his representative. The agreement for spending money must be made satisfactory to the Highway Commission and the supervision of the roads of the commission is extended

to the actual field work in the different towns. The old system of haphazard work has been stopped. In the matter of bridges and culvert work, town superintendents have been encouraged to build reinforced concrete structures. The state is divided into ten districts with an officer known as the district supervisor in charge of each. The district supervisor keeps in touch with all highway affairs of his own district and must audit the accounts. During the past year less than one-fourth of the errors and discrepancies of the preceding year were discovered. Under the direction and management of the district supervisors, towns have applied the patrol system of maintenance with excellent results.

A complete highway map of the state is in preparation which will show every road, culvert and bridge to a uniform scale of three inches to the mile. Every road is shown one-quarter inch wide and every culvert and bridge is numbered so that all correspondence can be carried out by the reference numbers. Prescribed forms of systematic cost data are used and the organization or road management is gradually becoming perfected to the most minute detail.

There seems to be every evidence that the ideal highway organization, at the present time is a strong state highway department which has funds for state aid in building selected roads throughout the state. Supplementary to the State Highway Department there should be major subdivisions of the state each in charge of a competent highway engineer responsible to the State Highway Department. The division supervisors or division engineers should exercise leadership and control over the subdivisions. In these subdivisions are counties with county engineers or county road supervisors (or if they consist of groups of towns with district engineers), the entire highway management is then complete.



This is a fine macadam road near Rome, Ga. Floyd county, in which Rome is situated, is the banner macadam county of Georgia

Location and Re-Location of Roads

By WILL R. WHITE

State Highway Engineer of Washington, Olympia, Washington

WHILE the subject of "Location and Relocation of Roads" is one to which a great deal of study has been given, and on which a great deal has been written, it is one to which little attention has been given by the road builders, especially by the county or township officials of the various states. Many reasons can be given for the poor location of the state and county highways over the country. In the earlier days the Indian made trails and they usually located them over the highest hills. In the first place, to better locate game, and later to reach the points of vantage in scouring the country for their enemies. As the country became settled these old trails were improved and used by the settlers, with only such modifications as necessity compelled. As the country developed and new roads were laid out there was a scarcity of funds, resulting in the location being made with the first cost in view rather than grades and alignment. This condition exists today to



Sand-clay road near Anderson, S. C. One of the best roads in western South Carolina. Note the defacement of road scenery by advertising signs

a great extent all over the United States, probably more so in our western and newer states than in eastern and older districts.

There is a tendency in some of our states and counties to burden the engineer with this condition in the construction of permanent roads by voting bonds and making appropriations for a definite road system, with terminal points fixed, with the particular kind of construction fixed, and the amount of funds fixed before the final location and estimates have been made. As a fair example, I will take Snohomish county in my state having a population of fifty nine thousand. The good roads people are very enthusiastic and have been advocating a one million five hundred thousand dollar bond issue. They have decided to use this money in the construction of one hundred and thirty five miles of road, having specified certain roads to be improved. They have decided that the roadway shall be sixteen feet wide, eight feet of brick, asphalt or wooden blocks on a concrete base, and eight feet of gravel. All of this information is being published in putting the bond issue before the people. The thing that they do not publish is the fact that at least one half of these roads must be re-located and re-graded at an expense of from

two to four thousand dollars per mile, and that any one of the styles of the pavement will cost them from ten to fifteen thousand per mile. This would make the average cost of improvement at least twelve thousand dollars per mile. If this bond issue carries what is the engineer to do? He will probably compromise between proper location and total number of miles to be built. As a result engineers will criticise him for his location and the voters will criticise him for not completing the road system. In either case the good roads cause will be injured.

One of the obstacles placed in the way of the engineer in making a proper road location is the custom of having the road on section or subdivisional lines. An other obstacle is the lack of eminent domain, or right of condemnation on the part of the state or road officials. The state of Washington is fortunate in this respect. The state laws provide for condemnation by the Highway Commissioner as well as by the board of county commissioners.

I will assume for the purpose of this paper that I am to deal with only the engineering and economic problems; namely, grades, alignment and cost. The relative value of these three questions depend upon the importance and class of roads.

I would classify the roads as follows:

1st. State and through roads, that is, roads to be constructed in sparsely settled or mountainous districts, and the connecting links between the various trade centers meaning not only the cities and towns, but also the tributary country,

2nd. County trunk roads, or main highways in the thickly settled districts including the main arteries leading into the country districts.

3rd. County feeders or branch roads.

As a rule the state and through roads are for light freight and tourist travel. The trunk roads are for both heavy freight and pleasure. The feeders are ordinarily freight roads with the heaviest loads usually being hauled to the trunk system.

Before considering the requirements of the several classes of roads I wish to say that the engineer in classifying his road must at all times consider the future possibilities of the country, and make his classification and location with the future in view. While he may only construct narrow dirt roads it is economy to get the permanent right of way and establish permanent grades with the first improvement.

Grades—This question is, I believe, the most important both in location and re-location. While numerous experiments have been made and theoretical tables have been compiled, I believe with Messrs. Harger and Bonney, who have a chapter covering this subject in their recent publication, "Highway Engineers' Handbook," that the actual traffic conditions, the topography of the country, and the money available govern the selection of the ruling grades.

The state legislature of Washington has fixed the maximum grade at 10 per cent. both for state roads and permanent highways. It has been the practice of this office to use a five per cent ruling grade; but the maximum has been used in several cases. Before choosing the ruling grade the engineer should study the to-

pography of the country and the ruling grade on the existing roads, between his location and the trade center, as it would be useless to expend any sum of money in reducing the grade, when a heavy grade exists or will be necessary in reaching the terminal. The ruling grade can be increased as you get farther from the trade centers.

For the purpose of this discussion I will quote direct from "Harger and Bonney" as I believe they have reached the proper conclusion.

"Construction of Maximum Grades. Natural grades are reduced to the required rate by cut and fill, by new locations around hills, or by new locations giving additional length for the same rise. The cheapest method is usually adopted, but sometimes where cut and fill would be the most economical in the first cost, the danger of drifting snow in cuts, or the damage to abutting property from deep cuts or high fills results in the selection of the more expensive construction. A large reduction of grade on a long hill necessarily requires a new location.

"Minimum Grades. Most road books claim that level grades should not be used because of the liability of water standing in ruts, and that a certain minimum grade should be adopted that would insure their longitudinal drainage. Baker states in his 'Roads and Pavements' that for macadam roads, English engineers use a minimum grade of 1.5 per cent. French engineers 0.8 per cent. and that American practice favors 0.5 per cent. Let us see what this means:

For a 1.5 per cent grade the fall would be 1-5 inch per foot.

For an 0.8 per cent grade the fall would be 1-10 inch per foot.

For an 0.5 per cent grade the fall would be 1-16 inch per foot.

"The flattest crown that is ordinarily used on bituminous macadam is $\frac{1}{2}$ inch per foot or $2\frac{1}{2}$ times as much as the greatest longitudinal fall in the above list. For long ruts a longitudinal grade is effective, but the patrol system of maintenance is supposed to prevent their formation and for short small depressions the crown slope must furnish the drainage."

The writer believes that there should be no hesitation in using the level grade; on such stretches the crown can be increased slightly to insure transverse drainage and the ditches given a minimum longitudinal fall of 0.2 feet to 0.5 foot per 100 feet, depending on the soil.

Intermediate Grades. The selection of the intermediate grades affords the greatest chance for economy on earth work. A grade so established that the cut in every cross-section would just make the fill at that point, would result in the least possible excavation. This condition is never realized, but the nearer it is approximated, the nearer we get to the most economical grading design.

It may be noted at this point that economy of grading should never govern the profile or cross-section where there is any good reason of convenience, safety, or appearance for placing the road at a certain elevation or giving it a certain shape.

In determining the profile the controlling features should be first noted; these are high water level of streams, elevations of existing bridges, railroad crossings, all points where deep cuts or high fills would damage the approaches to valuable property, connections with other highways, portions of the road that have been previously macadamized, and in villages the elevation that would give a convenient section and a finished appearance. The adopted grade must satisfy

these conditions. However, on the greater part of an ordinary road, the grade can be placed at any desired elevation, and it is on these stretches that the saving in earth work is effected. To get an economical design, a rolling grade can be used if necessary; long straight grades are not required, a mistake easily made by engineers trained in railroad work. Short grades are not objectionable, and a reverse verticle curve rides easily if well built. It appears that there is too much tendency to cut the top of every knoll and fill each hollow, for it seems a waste of money to reduce a 4 per cent to a 3.5 per cent or a 3.5 per cent to a 3 per cent



Section of the road just completed from Birmingham, Ala., to Jasper, in Walker county. Mr. Robert Norris, of Oakman, Ala., who sent in the picture, says that L. B. Musgrove, of Jasper, bore half of the expense of building the road, while citizens along the road contributed the remainder

grade where the ruling grade is 5 per cent. There should be no hesitation in spending all the money that can be obtained to reduce the ruling grade to a reasonable rate, but it is good policy to economize on all grades less than the maximum.

In conclusion, it should be stated that probably the most common error in the laying of a profile consists in making the excavation and embankment balance with short hauls, regardless of more important considerations, and in connection, and it cannot be stated too strongly that the grade must satisfy the controlling point; that any resulting excess of material must be overhauled or wasted and any shortage borrowed; that the economy must be effected on the unimportant stretches of road, and that by the use of short and rol-

ling grades the excavation can be reduced and a good profile obtained."

On roads that are to remain in the first and third classes I believe a ruling grade of 10 per cent permissible; such roads that come or will come under the second class should have an 8 per cent maximum and where possible a 5 per cent ruling grade. In general I would not spend any large sums to reduce a 5 per cent ruling grade. Density of traffic should be the governing factor.

Alignment; No one will question that the most direct course between two fixed points is the ideal. Therefore study the topographical conditions, consider all points from an economic standpoint to reach the ideal,



PRIZE WINNER FOR AUGUST

This photograph was sent in by Mr. R. P. Coble, highway engineer, Sanford, N. C. It shows a fine piece of road in Lee county, North Carolina.

Before improvement it was a terror to all travelers, as the picture on page 14 will show

taking into consideration the value of distance compared with cost of construction plus right of way and maintenance. In considering right of way one must look at the shape in which he is leaving the land through which he proposes to pass.

The value of a unit of distance is hard to calculate, as the amount and class of traffic is so variable. It has been my experience that the alignment has usually been settled by topographical or other fixed conditions before this question has been considered. However, I can recall cases in the farming districts of Eastern Washington where this problem will be met. The country is rolling and in many cases the grades are excessive. The existing roads follow section lines. The ideal location would cut through the field and divide

them into irregular pieces. When these roads are improved the locating engineer will have to overcome a strong local prejudice for section line roads, as well as consider the value of grades and unit value of distance.

The automobile has added a new question to the choice of the maximum degree of curvature. I can remember when we were governed more by the width of road bed and the need of a four horse team. As a matter of safety the maximum degree of curvative depends upon the reasonable sight distance required for a driver of a automobile going at an average speed to see an approaching machine or team. In thickly settled countries or on the main highways, this sight distance should be at least two hundred feet.

Where topographical conditions make this sight distance impracticable proper signs should be posted to warn the travelling public. I can recall numerous cases where the cost of reducing a 60 degree curve would be prohibitive.

Professor Baker has noted a point which many engineers overlook, and that is that the actual length of road surface on an easy curve going around a hill on a level grade is often less than a straight line over the hill.

In general I will say that State, Through and Main county trunk roads should be located with a view of getting the best grades and alignment without reference to local demand. Due consideration should be given to the connections with all existing or proposed roads.

In closing I would draw your attention to the fact that engineers are too severely criticised for spending money on so called useless surveys. While I believe that the engineer should make a complete reconnoissance before taking a party into the field, he should not hesitate to run sufficient preliminary lines to make a proper comparison of the cost of the different routes. He should not hesitate to abandon a location where he could make an improvement as it would take very little change in the cost of construction per mile to cover the cost of the new location.

Our locations for mountain work should cost us from one hundred and fifty to three hundred dollars per mile. These prices are for work in charge of competent engineers. Those not familiar with our mountains will think this cost excessive, but when you stop to consider that it is so brushy that it is necessary to have three or more axemen to average a mile of preliminary line a day, the same party averaging a half mile of location a day, you can get some idea of the expense. Our location parties usually consist of complete transit, level and topog crews. They camp out and with the cook make fifteen men to the party. In most cases the provisions can be hauled to them, but in some instances pack trains are required. Our final locations are usually made from contours taken from preliminary lines. In the settled districts and in the open country of eastern Washington the cost of location will range down to as low as fifty dollars per mile.

Mr. E. H. McHenry has summed up this question in stating that "The fundamental principle of good location is common sense."

Mr. R. B. Boyd, assistant state highway engineer, of Alabama, has awarded contracts recently for a mile of chert road at Birmingham to cost \$4,000, and four miles of gravel road in Marengo county to cost \$7,000.

Covington county, Mississippi, has contracted for the building of 37 miles of roads.

What Improved Roads Mean to a Town

By C. C. GILBERT, Nashville, Tennessee

FIRST IN IMPORTANCE, after the productive power of the soil, is the building and maintenance of public highways. The roads of a community are like the nervous system of a human body; upon their condition depend its health and growth.

The average country road makes country life less profitable, wastes time, labor, money and energy. The unimproved condition of our country roads contribute immeasurably to the drift of population cityward, and the condition of these roads are to-day extracting from the farmer a toll proportionately larger than the entire sum of his legitimate taxes, both real and personal.

Experience has taught us that good roads are expensive, but the absence of them is costing the people of the United States considerably more than to appropriate the necessary money with which to build first class

mean poor transportation. Good roads will help those who cultivate the soil to feed the millions, and whatever aids the producers of the country, increases the nation's wealth.

But great as is the loss to transportation, mercantile, industrial and farming interests, inconceivably greater is the loss to the social life of our country—a matter of as much importance as civilization itself. The truth, as expressed by another fifty years ago, that “the two greatest forces for the advancement of civilization are the school master and good roads” is emphasized by the experience of intervening years and points to the necessity of a union between the educational and industrial interests of our country in an aggressive campaign for good roads.

Public roads leading into a city are like the roots of a tree which go out in many directions gathering the moisture from the soil to give life to the whole tree. So it is with the public roads which reach from our cities. They are indication of life and prosperity to a city. The more sources of approach, the more prosperous is that city. There would be no quicker way of destroying a city than to isolate it—cut it off from outside communication.

A city is like a magnet, which, through its various forces draws and attracts from sections adjacent, but a city will not attract, neither will it draw unless there are means of access and egress. Radiating from every city should be a system of highways penetrating the interior sections of the entire territory. These highways should be so constructed and maintained as to be in good condition the entire year, then the people would come to the city more often and the merchants would have an average business the year around.

It means much to a city for roads to be in such condition that the farmer living in the country can take a load of produce to market any season of the year. When it is seen that the farmer is compelled to sell his produce at a certain season, he at once becomes the victim of the shrewd buyer, therefore, profits which belong to him go to the middle man. The cities are the central market places and unless there are good roads, the people cannot market their produce as often as they should, all of which means a loss to the city.

A people living unto themselves will become stagnant, their vision circumscribed and their ambitions and desires greatly reduced. What they need and must have, is a broad vision of things, and this can be had by coming in contact with other people, gaining thereby new thoughts and new ideas. This can only be accomplished where the means of transportation will permit. There are places, plenty of them, where it is impossible for the people of one neighborhood to visit the people of another neighborhood, on account of the poor conditions of the public roads. These conditions can be remedied by educating the people to the importance and value of good roads, and through this means bring about a condition whereby all the people will be benefitted.

Improved highways reduce the illiteracy in the rural sections, as good county schools follow closely in the wake of improved highways. Up to date school houses, longer school terms, better qualified teachers, modern



MR. C. C. GILBERT

roads. It is a difficult problem to get the farmer to see where it is better to increase his taxes a few mills on the dollar by voting a bond issue for road purposes rather than to market the yield of his farm over the bad roads between his farm and market place. In some counties in Tennessee the votes of the farmers have defeated a bond issue for road building when in fact they would receive the greatest benefit.

This is a day of conservation, and as the minds of the people are directed towards conserving their pecuniary interests the first question to be considered is the economical side of improved highways. The best investment a property holder can make is to contribute, in some form, towards the construction of public roads. This is true, not alone of the individual, but of the city, county and state as well. There are many instances where the building of a road or a street has more than doubled the value of property in close proximity.

The difference between good roads and bad roads is often the difference between profit and loss. Good roads mean cultivated farms, bad roads mean abandoned farms. Good roads mean easy travel, bad roads

school equipment all follow as the result of building good roads in a community.

The church problem, in some sections, is just as serious as the school problem. There are seasons of the year when neither church service or Sunday school are held on account of the condition of the public roads. The morals of the people would, therefore, be better if more attention was given to the building of public roads of a permanent character.

Good roads, like good streets, attract the very best people, they materially decrease the distance between farm and city. Good roads are the milestones marking the advance of civilization, they economize time to the extent that the merchant, the lawyer, the doctor can reside in the country and do business in the city. Over first class macadamized highways, the matter of a few miles never enters into the question. They are many places where two miles is further than twenty, and greatly preferred on account of the condition of the road.

What it means to a city to have good roads is summed up in this manner:

First, good roads are a foundation stone upon which a prosperous city can be built. A city must be built in a section which produces and as a spring supplies fresh water to the brook, so must the city be supplied from the surrounding sections. Therefore, a city is helped by reason of good roads because they extend far into the interior of the country and bring to the city those things which go to make a city prosperous.

Second, good roads mean farm development, material increase in valuation, consequently the taxable values of the country are raised by reason of the city being brought in closer proximity to same. The more

money raised outside of a city for defraying the expenses of the country, is just that much less the city will have to raise, therefore, the building of good roads from and into a city means the establishment of country homes and estates, thereby increasing the land values in the country. The farm valued at a few thousand dollars can be so improved and developed until its value reaches many times more. This is another reason why a city should foster and encourage the building of good roads.

Third, the instinct of the wild animal which roamed the primeval forest has been handed to us to the extent that we follow the laws of least resistance. We invariably do things in life requiring the least effort. We are going to travel the roads of least resistance. A city to be prosperous must draw to it people to trade and the city failing to provide suitable transportation facilities need not expect to draw its full quota of the outside trade. The man in the country with something to sell will go to the place where is kept something he can buy, but in this going and coming, the obstacles count for much. Therefore, the city providing the best thoroughfares is the city which justly merits all the trade it can get.

Mr. O. E. Weller, chairman of the Maryland State Road Commission, attended the International Road Congress in London, England, last month. After attending the roads congress Mr. Weller, with Commissioner W. B. Miller, who accompanied him, spent about two weeks inspecting European highways, with the result that he found them no better than those built in Maryland.



Bad piece of road in Lee county, N. C., before improvement. Lee county, while one of the youngest counties in the state, is one of the most progressive and one of the first things its citizens did after the county was created, was to vote a bond issue for road-building. They have worked wonders throughout the county

Fort Worth as a Center of Good Roads Development

By P. A. McCORMACK

Secretary Fort Worth Chamber of Commerce

WHEN Lincoln said, "He who controls the highways of a nation controls its destiny" he applied that remark to railways, or possibly, the forcible control of waterways, when they were the arteries of commercial life of the nation. He had not foreseen the almost miraculous growth in the use of the motor machine, for industrial or other uses. Had he done so, with that wisdom that was almost uncanny, instances, he might have phrased it "Control of a nation's highways control its destinies, but the nation's good roads are its very life," for the latter are an essential to higher development and without development there is no life.

Had Lincoln lived in this day he would have been inoculated with the "Good Roads Germ," beyond a shadow of doubt, and therefore it would seem that the proposed national highway across the country is a most fitting tribute to an American whom so many honor. And it is a tribute that will last through ages. Witness the Appian Way. That road is good though built 2,200 years ago.

A national highway across the country is no new idea. In 1796 congress authorized the building of a national road or pike, from Baltimore, westward, through Maryland, Pennsylvania, Ohio and Illinois.

That road was a pike, 30 feet wide, and though it was not kept up to the highest state of efficiency it is yet known as a good road, through parts of Maryland and Pennsylvania to Cumberland, Md.

The good road idea is no new thing. Merely interest is more general. That is, more people have been inoculated with the "good roads germ," and the movement for highway improvement has become general, by reason of that inoculation and in this work for the common good, Texas is taking a leading part.

Nothing is more conducive to the good roads propaganda, than the science that is now applied to road building, and the healthy public sentiment that interests itself in the location and construction of good roads, demanding of its servants, the public officials having this work in charge, rigid accountability for the expenditure of the money voted for this purpose. This latter has had a most potent influence in some of our Texas counties, where a body holding its tenure of office by popular vote, the county commissioners' court, controls all that relates to road and bridge building in the counties.

By reason of its location on the several important highways or roads crossing this state, Fort Worth has become the center of good road development in Texas. The Meridian Road, (the Canada to the Gulf Road); the Colorado-Gulf Highway; the Fort Worth-Texas Panhandle Road; The Scenic Highway, from San Antonio to Fort Worth; the Red River to the Gulf Road; and the Del Rio (on the Rio Grande) to North Texas road, all center at Fort Worth.

Recent discussion of a proposed southern route across the country from Los Angeles, Cal., to the Atlantic Coast, calls for a line through Fort Worth.

A stretch of road from Fort Worth to Mineral Wells, about 50 miles, running via Weatherford, has been des-

ignated as the road to have the benefit of the allotment of money to be made to Texas by the federal government, to aid in building an experimental, or demonstration road. The terms have been changed several times and the counties of Tarrant (Fort Worth,) Parker and Palo Pinto have promptly met the new requirements, the latest being the allotment of \$40,000 by the government to be met with the appropriation of \$80,000 by the counties. This has been done. Gov. Colquitt of Texas, after full consideration, designated the Fort Worth-Mineral Wells road as the U. S. Demonstration Postroad for Texas.

Tarrant county is spending \$1,600,000 on a system of good roads—with paved centers of from 12 to 18 feet in width, and gravelled shoulders, giving a roadway width of 25 feet—and on the bridges making the approaches to Fort Worth. Specifically the bonds voted were a million for the roads and \$600,000 for the bridges. Two of the latter are majestic viaducts, one carrying North Main street over the Trinity river is 1752 feet long and 70 feet wide the other the Seventh street viaduct will be 1,100 feet long, 60 feet wide. Two others are smaller but still large enough to involve an expenditure of about \$115,000 for the two.

The Tarrant county roads are built on a system planned by J. C. Travilla a noted road engineer, whose office was formerly in St. Louis. Radiating from Fort Worth the roads lead to the county boundary lines in general conformity to the main compass points, as for example the Cardinal roads are North, South, East, West; Sub-Cardinal roads are Northeast, Southeast, Southwest, Northwest. At the county lines they meet the roads of other adjoining counties, thus making continuous lines of travel to and from Fort Worth. Probably 50 per cent of the bridge work is done. The road work began May 12, the Texas Building Company of Fort Worth getting the contract for the construction of the 132.88 miles planned for.

That this work may have its full value as an object lesson for the whole state, Fort Worth will Aug. 7-8-9, entertain five state associations of county officials, in annual or semi-annual meetings. Those associations are county judges and commissioners, county tax collectors, county and district clerks, county and district attorneys and county treasurers. The first named are charged with all county road construction and maintenance. Arrangements have been made to afford the visitors, at least 1,500 delegates, the chance to see every process of improved road building, from cutting down grades to the established maximum of 5 per cent, in Tarrant county, to the final finishing of the surface that insures waterproofing and the smoothest surface allowing safe hauling.

Mt. Airy township Surry county, North Carolina, will grade 30 miles of road. The township has \$80,000, the proceeds of a township bond issue, to spend on roads.

The city of Little Rock, Arkansas, will pave 30 blocks with asphalt at an estimated cost of \$75,000.

Annual Meeting of the North Carolina Good Roads Association

A MOST successful convention of the North Carolina Good Roads Association was held at Morehead City on Thursday and Friday, July 31st and August 1st. There were in attendance prominent men from all over the state including the distinguished congressman from the First District, Hon. John H. Small, and those from outside the state were: Professor Arthur H. Blanchard, of Columbia University, New York; Hon. Jesse Taylor, President of the Ohio Good Roads Association and Vice-President of the National Highways Association and Messrs. Elias Van de Horst and Will Ward Duffield of New York, representatives of the National Highways Association.

The convention was called to order on Thursday, July 31st by Mr. H. B. Varner of Lexington, North Carolina, president. Hon. Charles A. Abernathy delivered the address of welcome in behalf of Carteret county in the absence of the mayor of Morehead City. Hon. John C. Drewery, President of the Chamber of Commerce of Raleigh, responded to this address of welcome in behalf of the delegates.

Joseph Hyde Pratt, secretary of the association, reported that since the last convention the association has been very active in working for the creating of public sentiment in behalf of better roads. He stated that he as State Geologist is constantly receiving requests for road engineering assistance, which he is unable to supply on account of lack of funds; and stating that, "for this reason, it is believed that this association can do no better than to bring about a sentiment for state engineering assistance to counties."

Mr. Pratt gave a brief review of road legislation passed by the general assembly of 1913, with a brief review of road work accomplished in the state since the last convention. This showed that the general assembly of 1913 passed twenty-seven county road bills providing for the voting on bond issues in various sums, aggregating a total of \$6,315,000. One hundred and five townships or road districts have been authorized to vote on \$2,762,500, and a general act applying to all the counties of the state, except four, provides that any township can issue bonds not exceeding \$50,000, so that practically the entire state is in a position to provide funds for the building of roads through bond issues. Since the convening of the legislature about \$2,737,000 of bonds for good roads have been voted or validated in twenty-five counties and thirty townships.

A paper was read by Captain R. C. Langdon of the United States army relative to the military value of good roads, which showed the necessity of building good roads so as to make it possible to connect one part of the country with another so as to send troops with the greatest facility in case of war, and bind together our citizens in time of peace.

Mr. H. B. Varner, president of the association, made a most vigorous and stirring speech in regard to the uses of state convicts on the public roads. He stated that it has been the custom of our state to lease the convicts to certain railroad interests and that the state has taken, in lieu of pay, stock in these railroads, which is absolutely worthless. His idea is that the convicts should be used on the public roads where all of the citizens of the state will get the benefit of their labor, and the state itself will derive a direct benefit. As the

convicts are at present leased, only a small section of the state gets any benefit at all, and certain individuals and corporations derive a very large direct benefit, without any actual compensation to the state.

The afternoon session on Thursday was postponed to a night session on account of the entertainment which was tendered the delegates by the city of Morehead, which consisted of a fish fry and surf party on the beach. This was greatly enjoyed by all of the delegates. The night session was held in the hall which was provided by the city of Morehead and was attended by four or five hundred people. Mr. W. L. Spoon of the United States Office of Public Roads gave a most interesting talk on the construction and maintenance of the sand-clay road, illustrating his remarks with charts prepared for this purpose. He showed conclusively that the sand-clay road is the most economical and best road for most of the rural sections of North Carolina; that it stands up better under all classes of vehicles including automobiles and motor driven trucks, as well as the horse driven vehicles; and by the constant and steady use of the split-log drag it is more easily maintained than any road known. Mr. Spoon answered questions in regard to the building of the sand-clay road and gave a great deal of practical advice which was greatly appreciated by the delegates.

The next speaker of the convention was the Hon. John H. Small, congressman from the First District, who was introduced by Mr. H. B. Varner as "North Carolina's best congressman, one who has done more for his district and more for his state than any congressman in North Carolina."

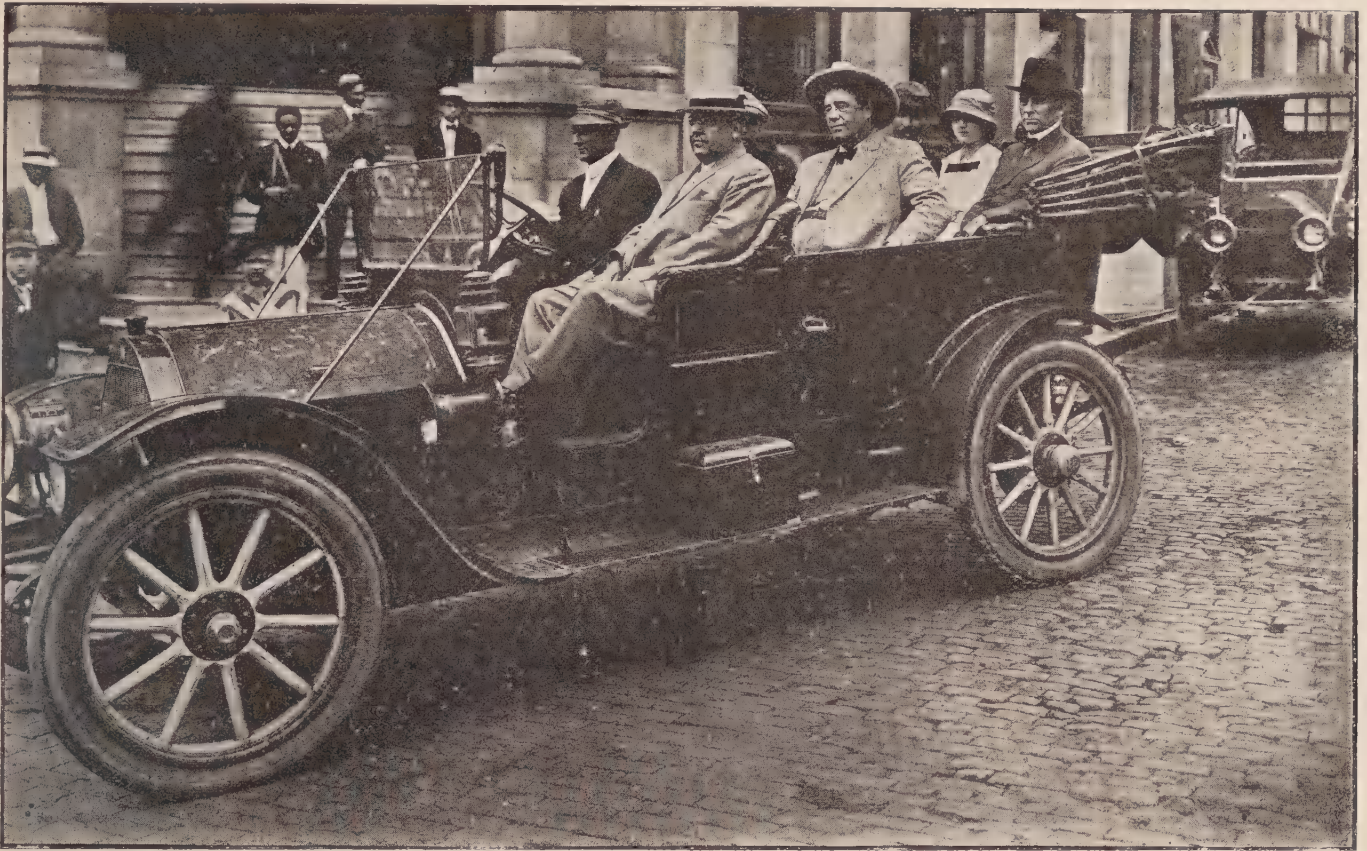
Mr. Small's address was of a high order, calling for a better citizenship in all the duties which pertain to the common weal.

On Friday morning the session began at 10 o'clock with a talk by Mr. W. S. Fallis, Road Engineer, on the general maintenance of sand-clay, dirt, and macadam roads. Mr. Fallis gave some most interesting facts in regard to the subject assigned him. He is an engineer of exceptional ability and is responsible for the magnificent sand-clay roads of Franklin county, which have gained national reputation.

Following him was the Hon. Jesse Taylor, President of the Ohio Good Roads Federation and Vice-President of the National Highways Association, who made a most stirring and interesting speech, pleading for National Highways which will bind together every state in the union and make for the betterment of every section through which they pass. The North Carolina Good Roads Association has been invited to become affiliated with the National Highways Association, and this matter was taken up at this convention.

Following Mr. Taylor, Professor Arthur H. Blanchard of Columbia University gave a most interesting paper on the Third International Road Congress. This, together with Mr. Taylor's speech, provoked considerable comment and remarks; and the Hon. John H. Small spoke in regard to the building of National Highways by the federal government.

Following this, Professor T. F. Hickerson of the University of North Carolina gave a paper on the Duties of the Highway Engineer. It was followed by talks from road engineers, superintendents, county commis-



CENTRAL HIGHWAY INSPECTION PARTY

The second tour of inspection over the Central Highway began July 25 at the Tennessee line and ended at Morehead City, July 30. Mr. H. B. Varner, chairman of the board of directors of the Central Highway, is on the front seat with the chauffeur. Behind him is Col. Dell M. Potter, of Clifton, Ariz., president of the Southern National Highway Association. Governor Locke Craig, of North Carolina, is immediately behind Col. Potter and beside him Mr. G. D. Canfield, trustee of Central Highway, and daughter, Miss Canfield, of Morehead City, N. C. Owing to ill health, Governor Craig was unable to make the entire trip.

sioners, etc., in regard to road work which was being accomplished in their various sections.

Mr. Fallis reported for Franklin, Iredell, Catawba, and Vance counties; Mr. N. C. Hughes, Jr., for Halifax county; Mr. Woodard, Chairman of the Board of County Commissioners, for Wilson county; Mr. R. P. Coble for Lee county; Mr. J. C. M. Valentine for Rutherford county; Mr. Jno. E. Moore for Northampton county.

Following this, Hon. James C. Wellons made a talk in favor of bond issues for public roads. Mr. Bryan of New Bern, spoke against bond issues. A call was made for those who favored the bond issue method to stand up and only one vote was cast against it—that of Mr. Bryan.

It was decided that a Resolution Committee should draft resolutions, and report at a special meeting of the legislature in Raleigh. A number of resolutions, however, were passed on the floor of the house as follows:

Whereas it appears to the "North Carolina Good Roads Association" in convention assembled at Morehead City, N. C., on this 31st day of July, 1913, that, under the existing laws of the state of North Carolina, persons imprisoned in the state prison at Raleigh have for a long while been and are now being hired to certain persons, firms and corporations engaged in grading, building and constructing certain railways or railroads in the state of North Carolina, and as a consideration for the services performed by said convicts in the grading, building and construction of said railroads or railways, said persons, firms or corporations pay no sum or sums of money into the treasury of

North Carolina, but in lieu thereof, and as the only consideration for such services performed by said convicts, said persons, firms or corporations issue certain certificates of stock in said railroads or railways to the state of North Carolina;

And whereas it further appears to this association that a majority of the stock in said railways or railroads which has been heretofore and which continues to be issued to the state of North Carolina for the services of said convicts is absolutely worthless;

And whereas it further appears to this association that the convicts which are being placed with and hired to said persons, firms and corporations are greatly needed and could be used more profitably and to a better advantage in the construction and maintenance of the public roads and highways in the various counties of the state of North Carolina.

It is, therefore, Resolved:

1. That the general assembly of North Carolina, which has been called to meet in Raleigh, N. C., on the 24th day of September, 1913, by His Excellency, Locke Craig, Governor, be and it is hereby earnestly requested to enact such laws and to pass such resolutions as will effectively withdraw all convicts which have been heretofore placed with or hired to any person, firm or corporation engaged in grading, building or constructing any railroad in this state, where the services of said convicts is to be paid for in stock or bonds or any other interest in such railroad or railroads, and to prohibit the further placing or hiring of convicts to any person, firm or corporation; and to provide for the working of said convicts upon the highways which are known and designated as such in the various counties

of the state of North Carolina which are now in existence or which may be hereafter established.

2. That the Secretary of this association be and he is hereby authorized and directed to have this resolution printed and copies thereof mailed to each and every member of the general assembly of North Carolina within thirty days from the passage hereof.

The above resolution was prepared by a special committee composed of: Mr. W. C. Douglas, Chairman, R. R. Cotton, and Wm. Dunn.

Another resolution was adopted as follows: Resolved: That it is the sense of the North Carolina Good Roads Association that, in the interests of highway improvement in the country, the United States Government should become a member of the Permanent International Association of Road Congresses, as Great Britain, France, Germany, Russia, Italy and the other great countries of the world have; and be it further Resolved: That copies of these resolutions be sent to the Secretary of State, the Secretary of Agriculture and the Postmaster General.

A motion was made and passed that the legislature be requested to establish a highway commission with sufficient funds to meet the present demand of the state for engineering assistance.

Each session of the convention was marked by a spirit of enthusiasm and interest. There were present about two hundred delegates, all of whom seemed intensely interested in the proceedings and many participated in the discussions. A complete stenographic report of the convention will be published as an economic paper by the North Carolina Geological and Economic Survey in co-operation with the North Carolina Good Roads Association.

For the coming year the old officers were re-elected as follows: Mr. H. B. Varner, president; Joseph Hyde Pratt, secretary; Miss H. M. Berry, assistant secretary; Joseph G. Brown, treasurer. Motions were made and passed thanking the city of Morehead for the courtesies extended. The meeting place for the next regular convention was left to the executive committee.

Tenth Annual Meeting of National Paving Brick Manufacturers' Association.

Engineers and contractors from many sections of the country are to gather at Cleveland, Ohio, September 17 and 18 on the occasion of the tenth annual meeting of the National Paving Brick Manufacturers Association. In former years the association has held its annual meetings during winter months, but at the last yearly assemblage of the paving brick manufacturers it was decided to hold future conventions during an "open season."

This will afford, instead of the usual program of written papers, discussion and criticism of brick street and brick road construction methods while work on the highways is in actual progress. The large amount of construction work in Cleveland and Cuyahoga county will afford splendid opportunity for investigation in a most practical way.

Officers of the National Paving Brick Manufacturers Association are, Charles J. Deckman, Cleveland, president; Will P. Blair, Cleveland, secretary; C. C. Barr, Streator, Illinois, treasurer.

Prevost Hubbard, in charge of the Division of Roads and Pavements of the Institute of Industrial Research, Washington, and Lecturer in Engineering Chemistry in Columbia University, has been retained as Consulting Highway Chemist by the Department of Efficiency and Economy of the State of New York.

Governor Emmett O'Neal's Good Roads Proclamation.

Whereas, the value of our farming lands, the products of our soil, our mines and our factories and the attraction of rural life as well as our industrial development would be largely enhanced by a better system of public roads and highways throughout the state, and, in order to lend official encouragement to the growing sentiment for better roads, now, therefore, I, Emmett O'Neal, as governor of Alabama, do hereby, by this proclamation, name August 14, 15 and 16, as "Good Roads Days," to be observed in every county in Alabama.

I earnestly urge that the Probate Judge in each county designate some section of the public road in his county to be improved during said "Good Roads Days," such improvement to be made under the supervision and direction of some engineer or other competent person.

I also urge that after such section of the road within the respective counties is designated for improvement that the Probate Judges, Boards of Revenue, or Courts of County Commissioners shall cause to be made written plans and specifications describing how such improvements shall be made and be filed in the Probate Judge's office, and that each Probate Judge shall, prior to said "Good Roads Days" secure a list of all persons who are willing to work said roads, or to make contributions therefor, and invite all classes of our citizens able to do manual labor to meet on the 14th of August along such section of the public road to be improved at 7 o'clock on said date and to work and continue working such section of the public roads to be improved until the expiration of the said "Good Roads Days."

Let each county vie with the other in this important undertaking. Let our people imitate the examples set by other states, where lawyers, doctors, bankers, merchants and all classes of the people contributed from one to three days labor to the improvement of the roads within their counties and by which method splendid results have been achieved.

I suggest that each Probate Judge request those who are unable to do physical labor to employ substitutes and that all classes of our people be invited to make contributions in material or money.

Every intelligent man in Alabama advocates good roads, but such advocacy can bring no material results unless it is evidenced by contributions in labor and money or road-building machinery, material and tools.

The Probate Judge of each county is requested to forward to this office the names of those in each county contributing most liberally to the improvement of the roads during these "Good Roads Days," said names to be filed among the archives of the state and to be published in the daily press and a suitable medal to be presented.

I earnestly urge that every board of Trade, the Mayor of every municipality and every member of every Good Roads Association in the state co-operate with their Probate Judge in giving effect to these suggestions.

EMMETT O'NEAL,
Governor.

State Highway Engineer A. N. Johnson, of Illinois, has recommended either concrete or brick for the state aid main roads to be built under the highway law of that state.

Dale county, Arkansas, has contracted for six miles of sand clay road.

News Notes of the American Road Congress

"National Aid" and "National Highways" will engage the attention of the delegates to the American Road Congress during one session of the six which will be held at Detroit during the week of September 29th. It is expected that Ex-Senator Jonathan Bourne, Jr., Chairman of the Joint Committee on Federal Aid in the Construction of Post Roads, will place before the Congress his plan for lending the credit of the national government to the states through the ultimate issuance of a billion dollars of good roads bonds. Senator Swanson, of Virginia, also a member of the Joint Committee, will explain his plan for an annual cash appropriation conditioned upon an equal appropriation by the states and an equal division of responsibility for construction and maintenance. The Shackleford plan, given great prominence by Hon. D. W. Shackleford, the chairman of the Good Roads Committee of the United States House of Representatives, will also be explained to the good roads delegates. Mr. Shackleford's plan provides for a system of rewards on all rural delivery roads meeting certain requirements. Differing from all of these schemes is that which provides for a system of national highways built and maintained entirely at the cost of the national government. A champion of this plan will also be heard. After the presentation of the various schemes now advocated for adoption by the government, discussions will be had and an endeavor made to harmonize differences and, bring about the announcement of a definite policy for submission to the congress of the United States by the American Road Congress. As a majority in both the senate and the house of representatives favor some form of government aid it is important that this great national gathering of good roads workers should take definite action.

Detroit is planning a notable series of social events in honor of the American Road Congress. These will comprise banquets and informal entertainments by the Board of Commerce, the Wolverine Club, the Adcraft Club, and the Rotary Club, a public reception at which all of the delegates in attendance at the congress may have an opportunity to meet the distinguished guests from Canada and the United States, and a boat ride and smoker on one of the huge excursion boats plying on the Detroit River, as well as numerous automobile excursions to points of interest in and about Detroit. The citizens of that enterprising city claim that nowhere in the world is the climate so delightful as in Detroit during the first week in October. They say that Belle Isle Park is the most beautiful in the world, that the Detroit River carries more freight than enters the harbors of New York, Boston, Philadelphia, Baltimore and San Francisco, combined, that the nearness of the city to the wonderful vacation and fishing regions of northern Michigan and Ontario make it the ideal convention spot and that its great manufactures are worthy of a trip of inspection on their own account.

Logan Waller Page, Director of the U. S. Office of Public Roads, will read a paper at the Road Congress at Detroit on the Selection of Road Materials. Before he was appointed to his present post Mr. Page assembled at Harvard University the first road material testing laboratory in America, following his studies at the French School of Roads and Bridges, and his name is now identified with some of the best known apparatus for road material tests. The selection of road materials is an exceedingly important factor in the building

of a road and it is certain that Mr. Page's paper will receive the closest attention.

A subject which will be taken up at the contractor's session of the Road Congress, at Detroit, which should prove of special interest to road contractors is the Protection and Upkeep of Road Equipment. An immense amount of money is lost through failure to protect and properly maintain costly road machinery and equipment. Another subject which will be presented by a trained specialist is the Organization and Arrangement of Working Forces. It is quite a problem to place the road hands of a big force so as to avoid waste of time and money and this subject should bring out much useful discussion. A special committee of three of the most prominent engineers and contractors identified with contract work, of which Mr. J. R. Wemlinger, Secretary American Society of Engineering Contractors, is chairman will have charge of the program of the contractor's session.

The American Bar Association and the American Bankers Association have each authorized special committees to co-operate with the management of the American Road Congress in the holding of sessions at Detroit to deal respectively with road legislation and the financing of road improvement. An effort will be made at the legislative session to bring about the formation through official channels of a national committee to codify state road laws and recommend simple and uniform legislation for each state and the elimination of the great accumulation of conflicting and confusing road laws. The finance section will endeavor to have adopted in all parts of the country simple and effective methods of road accounting and a record of such cost data as may be essential to the proper conduct of road work, and will also deal with the important subject of bond issues.

The Latest "Lincoln Highway" Project.

Lincoln highway projects of the past pale into insignificance beside the Lincoln transcontinental enterprise recently incorporated in Detroit to succeed the Manufacturers' Ocean-to-Ocean Highway association of Indianapolis. The great prestige of this venture lies in the fact that \$4,200,000 accrued to it from its predecessor. With this sum as a nest egg, the fulfillment of its mission, namely, the linking of a through road between New York and San Francisco by 1915, is thought to be practically assured.

The original plan of the manufacturers who launched the enterprise has not been changed one iota, save for the dedication of the venture to Abraham Lincoln. This feature was added as a happy afterthought. The basic idea is still to furnish the American people an object lesson in good roads so that they will become a necessity and not a luxury. It is thought that the building of one uniformly excellent, indestructible trunk line through the parallel and link highways it will inspire, will do more to hasten the era of good roads than any other agent.

Subscribers to the venture are found in every walk of life. On the list which produced the original \$4,200,000 are numbered manufacturers, civic associations, motor clubs, merchants and private individuals. Aside from selfish or pecuniary interests each one of these contributors is actuated by the consciousness that he is doing something for the public good.



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CONVICTS ON THE ROADS.

The Good Roads Year Book for 1913 reviews very interestingly the progress of the movement for using convict labor in roadbuilding. According to the statistics given it appears that a majority of the states of the union are now using convicts on the roads to some extent and in almost every case the experiment has been entirely successful. In many states the counties are allowed to use their own convicts on the roads and in others the state puts all of the convicts to building roads.

Ten counties in Alabama, according to the Year Book, use convicts on the roads. State Highway Engineer W. S. Keller has figured out the cost for each convict to the county using him at 60 to 65 cents per day. He finds that convict labor is even more efficient, when properly managed, than paid labor. He found further that the convicts worked on the roads were in much better physical condition than those confined in jails.

Arizona experimented with a small force in bridge-building with fair success. The prisoners were nearly all Mexicans and all totally unacquainted with bridge work but the engineer in charge estimated their efficiency at 66 per cent.

In Colorado the convict labor system has reached its highest efficiency. This state built 132 miles of fine

highway last year and the cost was only 32 cents a convict per day. A parole system has been worked out and in many parts of the state the convicts were worked without guards.

California tried the system last year for the first time and State Highway Engineer A. B. Fletcher, was highly pleased with results. He says that convict labor, according to their experience, was as efficient as paid labor and that the effect on the health and spirits of the men was excellent.

In North Carolina, where individual counties under special acts of the legislature, have long used convict labor, there is a movement to place all of the state convicts at the service of the counties, instead of leasing them to railroads and other private corporations.

The state of Georgia leads all of the states of the nation in this respect, having 5,000 convicts actively engaged in building roads in all parts of the state. The prison commissioner estimates that the cost is less than half of that of free labor and the health of the prisoners more than twice as good as under the old lease system which prevailed until a few years ago. Last year Georgia led all of the states of the south in road-building and was well up among the leaders in the nation. Her primacy in this respect is attributed solely to the policy of working convicts on the roads.

In Illinois, Kansas, Louisiana, Minnesota, Montana, Nevada, New Jersey, Washington, Virginia and Oregon the plan has been tried with almost complete success and it is practically certain that every state in the union will be working convicts on the public roads within the next five years.

GOOD ROADS PROCLAMATIONS.

A year or two ago the state of Iowa startled the country by building a road nearly 400 miles long from one end of the state to the other in a day. Led by Col. "Lafe" Young, editor of the Des Moines Capital, the people of the section through which the road had been routed, rose as one man and with picks and shovels, teams and road drags, put every mile of the great highway in good condition.

From Iowa the idea spread and during the past two years, many communities and many counties in various parts of the union have had good roads days and called for road-building volunteers. Last year the governors of a few states issued "good roads proclamations" and called all good citizens to give of their time and substance for the advancement of the good roads cause.

Recently Governor Elliott W. Major, of Missouri, made proclamation setting aside August 21 and 22 as good roads days and elsewhere in this issue of Southern Good Roads is the proclamation of Governor Emmet O'Neal, of Alabama, setting aside three days in August for the same purpose. This is Governor O'Neal's second good roads proclamation. In August 1912 he issued his first and it met with generous response. Thousands of loyal Alabamians responded to it and

many thousands of dollars worth of work was done on the roads.

In Michigan the plan was tried last spring and it took with a rush that surprised and delighted the good roads folks of that state. Everybody answered the call. It is recorded that a distinguished college president, who is known all over the land, shoveled gravel all day long.

In North Carolina recently Col. John T. Patrick, an eminent town builder, called for volunteers to help build a section of the Central Highway in the Chimney Rock section of Madison county and the people came. The road was built in two days with free labor.

The plan is a good one and we hope that it will spread to other states. It arouses interest in roads as nothing else does, sets one community to vying with its neighbors and invariably results in good.

Governor Major and Governor O'Neal have set an example that other southern governors should follow.

A New Federal Aid Bill Drawn.

There are more than 100 good roads bills of various kinds neatly hid away in the archives of the U. S. Senate Committee on Post Roads, all or nearly all, of them forgotten. It now appears, however, that a bill may get by this committee and actually be presented to the Senate and that is a bill prepared recently a committee of four from the United States Good Roads Association.

This committee is composed of Senator John H. Bankhead, president of the U. S. Good Roads Association, formed a few weeks ago at Birmingham, Ala., who is also chairman of the Senate Committee on Post Roads; Hon. E. J. Waston, commissioner of agriculture of South Carolina; Dell M. Potter, of Arizona, president of the Southern National Highway Association and Thomas L. Cannon, of St. Louis, Mo. The committee met last month in Washington and drafted their bill, which is intended to be a substitute for all the bills now asleep in the pigeon-holes of the Committee on Post Roads.

In an interview which appeared in the Columbia (S. C.) State a few days ago Commissioner Watson said that among other things the measure would provide for an appropriation of \$25,000,000, to be used in giving good roads to every state, county and township in the country which desires them, and will put up \$1 for every dollar of federal funds received. The proposed bill will, said the commissioner, abolish the Office of Roads of the United States Department of Agriculture, and establish, instead, a bureau of public highways as a branch of the postoffice department, and under a commissioner of public highways, who will be appointed by the president and confirmed by the senate. The measure will thus be brought directly under the constitutional provision requiring congress to establish post roads.

The proposed measure, which has for its basis the Swanson good roads bill, will provide further that in apportioning the funds out to the state, county or township, as the case may be, the first 50 per cent. of the amount to be given the state, county or township will be based on population, and the remaining 50 per cent. on rural mail route mileage.

For every dollar spent out of the federal fund of \$25,000,000 a dollar must be put up by the territory

in which the road is to be constructed. All work will be done under federal supervision.

Provision is made also so that whether or not a state as a whole, or a county as a whole, elects to take advantage of the federal fund, the county or the township can do so. In other words, if part of the people want the good roads in their territory they can have them, regardless of what the rest of the county or state might want.

Commissioner Watson said that the main object of the measure was to "get something done."

"The one thing which the democratic party will have to do in order to remain in power will be to work out a broad constructive policy," said the commissioner.

President Wilson Will Prepare Address for American Road Congress.

A conference of great importance to the national road movement was held at the White House July 22, at which President Wilson received a committee from the American Road Congress, which is to be held in Detroit, Michigan, Sept. 29 to Oct. 4. The committee consisted of Congressman Frank E. Doremus, representing the congressional delegation from Michigan, the Detroit Board of Commerce, and various commercial organizations of that vicinity; W. W. Finley, president of the Southern Railway, chairman of the executive committee of the American Highway Association; George C. Diehl, representing the National Good Roads Board of the American Automobile Association; and J. E. Pennybacker, secretary of the congress, which is being held under the auspices of these two organizations. Mr. Diehl also represented J. N. Carlisle, state highway commissioner of New York State, which state is expending over \$100,000,000 on highways, and is most actively co-operating in making the road congress the most successful good roads meeting which has ever been held.

The President stated that, owing to the press of official duties, he had been obliged to forego for the entire calendar year attendance at national conventions, and would therefore be unable to be present in person, but gave the most substantial and cordial evidence of his interest in the road movement. He indicated his willingness to prepare an address to be read at the opening of the road congress, and to have the national administration represented by a member of the Cabinet.

The American Road Congress represents practically the entire organized road movement of America, and although held under the auspices of the American Highway Association and the American Automobile Association, it is officially participated in by more than 100 organizations, including the National Grange, the National Old Trails Road Association, the Travelers Protective Association, various State Good Roads Associations, and the State Highway Departments of the various states.

Governor Major, of Missouri, announces that he is going to issue a proclamation soon naming two days in August as good roads days and asking every able-bodied citizen of the state to get out on the roads and do effective work for the improvement of the highways of the state. Governor Major believes that 250,000 patriotic Missourians will respond to the call and do valiant service for the cause of good roads.

Macon county, Alabama, will surface with top-soil four miles of road at an estimate cost of \$4,000.

Who's Who in Highwaydom

The State Highway Commissioner of Missouri occupies a brand-new office. It was created by the 1913 legislature which passed more progressive legislation than any previous general assembly in the history of the state. The law has been in operation for only a few weeks. It might be said, to use a familiar figure of speech, that the official chair had hardly been warmed by its occupant. It would be more truthful to say that it had not been warmed at all. The chair is gathering dust, except for the kindly care of the capitol janitors, while the commissioner is in transit along the roads of the state talking with farmers in the fields by the way, conferring with township and county officials, or



HON. F. W. BUFFUM

addressing gatherings of men interested in better communication between different portions of Missouri.

While the law is brand-new, the commissioner isn't. All unconsciously to himself, he had been in preparation for the job for twenty years. Frank W. Buffum does not belong to the office-seeking class. He is a Pike county lumber dealer, with a string of retail lumber yards, and is—incidentally—a manufacturer of pearl buttons. Now no man can be in the lumber business in a rural district, and not be brought squarely in contact with the problem of rural roads; and with Buffum, who is built on a generous model, with both weight and energy to spare, to recognize a need is to try to do something about it. Twenty years ago Mr. Buffum saw that better roads would be better for the man who sold lumber to the farmer and better for the farmer himself. But he did not stop there. He saw that what was bad for the farmer and the lumber dealer was bad for the man who kept the general store, bad for the doctor, bad for the lawyer, bad for the farmer's children who were going to school, bad for folks in town who did not get into the country twice a year, bad for the man who drives a motor car and pays for gasoline, bad for the man who sells it—bad for the state. This is an age of fads. Some men are enthusiasts

on Oriental rugs; some play golf; some collect merschaum pipes. Frank Buffum became an enthusiast on good roads. He preached, he worked, he practiced.

So when a modest good roads bill, introduced by Representative Brentz at Jefferson City last winter became transformed—not to say transfigured—in the committee-room, and came out providing for a State Highway Commissioner, Gov. Major thought of the Pike county good roads prophet, and appointed him.

It is not enough to have a good man; he must have good tools. Last winter Senator Hawkins of Dunklin county—down where the alfalfa yields five crops a year in the Mississippi bottoms, and the watermelons are "a sight for sair een," as the Scotch say—introduced a bill which the legislature passed, providing for a system of state roads connecting county seats. The bill appropriated \$15 a mile annually for dragging roads connecting the county seats of adjacent counties, the route to be selected by the county highway boards and the State Highway Commissioner. This statute, which passed without attracting much attention, is fairly transforming the roads of rural Missouri.

Every farmer whose front gate is on a road anywhere near a right line between two county seats is fired with ambition to have the highway in front of his farm maintained in part by the state. The state is taking care to encourage this ambition and is spreading enthusiasm and inspiration right and left, exercising due care to make selection, in every case, of the best route. Result: In some parts of Missouri 4 and 5 routes are being improved between county seats.

Here are the specifications which must be met before a route will be considered:

Highway, forty feet wide.

Thirty feet clear between outsides of ditches.

Hedges cut to five feet high.

Hedges cut 150 feet back from corners to give unobstructed view of vehicles approaching each other at right angles.

Culverts of concrete.

Crown of road two feet higher than gutters.

No grade more than 7 per cent—which is much less than half of the grade of many streets in Kansas City, and practicable for heavy hauling.

Commissioner Buffum is going about as a good roads missionary among Missouri farmers. "Why do you haul light loads over those hills and hummocks?" he will ask. "Why not relocate that road? We can pick out good grades by a detour here, and cut through that ridge there. The new road won't wash out as the old one does, and you can haul twice as much with a team of a given weight for you can cut the ruling grade in half." And his trail over the state is marked by a swarm of men with teams, shovels, pick axes and wheeled scrapers.

Commissioner Buffum has made one discovery that ought to interest every retail merchant in the land. It is that bad roads help the catalogue houses. "When country people are kept at home by bad roads," he says, "it is natural that they should amuse themselves with mail-order catalogues. So some man decides to send in an order; he will buy a set of light harness; his wife wants a meat chopper; his daughter goes in for a pair of white shoes. Then they call up their neighbors, and the woman on the next farm but one decides to order a skirt, while her husband gets a new hat. If the roads were good they would go to town instead of studying catalogues at home. They would see the goods carried by their home merchants and would buy them instead of the stuff in the catalogues."—Paul W. Brown, Editor in Charge, St. Louis Republic, St. Louis, Mo.

Road-Building, Road-Boosting and Road-Boosters Throughout the Nation

M. Fornand Bordas, a leading French engineer, writing for the Third International Road Congress, in session in London last month said: "The National roads, which connect the capital to the frontiers and to the large towns, or else form a connecting link between the more densely populated centers, are of the greatest interest to the country as a whole, not only from an economic point of view but also from a strategic one, as assuring communication between points at long distances apart. It is therefore essential that their general trend, general plan, and width, should be settled unfettered by local influences."

* * *

"If France, with about four times the area and four times the population of New York State, can adequately and economically provide and maintain from a centralized source a national roads system of 24,000 miles, it is not unreasonable to contend that the same thing can be accomplished for the whole United States," asserts Lewis R. Speare, of Massachusetts, who served as chairman of the resolutions committee of the second Federal Aid Good Roads Convention.

"France admittedly has the best roads system so far devised," continues Mr. Speare, "and its national roads constitute about 6½ per cent. of the 365,000 miles in the whole country."

"The National roads, maintained entirely by the government, are constructed 42 feet wide between ditches, and lead from the capital to the principal cities, ports and commercial centers, and between the principal cities. With the departmental or state roads, and commercial roads of different classes, the national government has nothing to do except to determine their width, which is fixed by general laws according to their classification.

"The United States has two and a half times the population of France, and about six times the road mileage. To balance this difference, a series of national roads which would connect our capitals and principal cities would duly amount to about 2¼ per cent of the 2,200,000 miles of roads in this country as compared with the 6½ per cent in France, bringing the mileage of national roads per person in the United States about the same as in France.

"With our enormous resources awaiting development by the extension of our road systems, there seems no reason why we should not proceed with the work of building national roads. National roads building did not ruin France; it made France great."

* * *

An excellent point in favor of highway improvement was made by Charles H. Davis, president of the National Highways Association, in an address before the society for the promotion of engineering education, at its annual convention in Minneapolis, notes the Chicago Inter-Ocean. Mr. Davis maintained that good schools are largely dependent upon good roads, and made the further point that good roads would more than pay for their cost by vastly increasing the value of the agricultural lands of the country. Thus, he said:

"The value of the farm lands and buildings in the United States is \$35,000,000,000. Two million miles

of improved highways will increase the lands \$10,000,000,000, or about one-third of their present value."

The fact that good roads pay for themselves in increased values of farm land and decreased transportation expense has long been conceded, continues the Inter-Ocean. But that good roads actually foster education is a point seldom made.

* * *

At the good roads meeting at Dayton, Tennessee, last month, when 500 official delegates and more than 1,000 visitors assembled to boost the "Market to Gay" highway, a good roads oration was delivered by a man who had not made a speech in all of his 60 years of life, which was pronounced the best the people of that section had heard since the campaign of James B. Frazier and Jesse M. Littleton for governor several years ago. It was made by Mr. John Moleneaux, a native of England, for the past 30 years a citizen of Roane county, Tenn.

Mr. Moleneaux, in his shirt sleeves and dressed as a plowman, laid bare two great arms with muscles equaling those of a heavyweight pugilist and eloquently advocated the "arm and hammer" method of building roads.

"It's a disgrace to farmers," he said, "to have had roads about their lands. Get out and knock off the rocks protruding from the road and fill up the holes. I came to Tennessee over thirty years ago. I hadn't been here thirty-six hours until I was working the roads and I am doing it now.

"I vote the republican ticket, but I don't know anything about politics, and I don't depend upon the politicians at Nashville to build roads."

* * *

Mr. Louis Spencer Daniel, managing director of the Merchants and Manufacturers Association of Floyd County, Georgia, has been an earnest advocate of intelligent, non-partisan state supervision of highway construction in Georgia for a great many years and it begins to look like the present Georgia legislature is going to provide for it. At a recent meeting of the good roads committee of the Merchants and Manufacturers Association, held at Rome, the following resolutions were adopted, after a discussion led by Mr. Daniels and W. M. Gammon, chairman of the Good Roads Committee:

"Whereas, there has been for many years an unsystematic order of road building in Floyd and other counties of the State of Georgia, at an enormous expense with very unfavorable results; Therefore, be it resolved, that this association make earnest appeal to the members of the present Georgia legislature and the Governor of the State of Georgia, for a State Highway Commission to consist of one or three or five commissioners, to be appointed by the Governor, and to be vested with full power to direct the building of a county site to county site highway in each county in the State of Georgia through the co-operation of the state and county, and for the maintenance of said system of roads by state and county; the State Commission to be fully empowered to locate said roads.

"Be it further Resolved, that the Governor be empowered to appoint expert road builders and not

state or county politicians upon said commission, at an annual salary to be determined by the present legislature;

"Be it also Resolved, that the secretary of the Manufacturers and Merchants Association be authorized to appeal to every Chamber of Commerce, Board of Trade and other forces and organizations of the State of Georgia, to join with this association in its urgent appeal to the present legislature and Governor. Furthermore, that said secretary shall make immediate request of the Governor and both houses of the legislature for a hearing before the joint houses and the State Executive at the earliest date possible to be named and set by the Governor and speakers of both houses.

"Be it further Resolved, That the secretary of this association ask the immediate co-operation of all Boards of Trade and Commercial Organizations and all Mayors of county sites and towns of the State of Georgia by the endorsement of this resolution which will be sent immediately to their respective representatives in the present Georgia legislature.

"Be it Resolved in conclusion, That concerted action and co-operation between state and counties without delay, will be the means of saving millions of dollars for the State of Georgia, and the means of obtaining and maintaining a complete net-work of county site to county site highways that will be invaluable to the entire State and the South."

* * *

It is announced that W. O. Westgard, field representative of the American Automobile Association, who went west with the Indiana-Pacific tour in his famous Pathfinder "40," which crossed the continent three times last year, will return to New York by way of San Diego, Phoenix, El Paso, Fort Worth, Dallas, Memphis, Nashville, Bristol, Washington, Baltimore and Philadelphia.

The men behind the Southern National Highway project should make an effort to have him follow the line of the highway through North Carolina and Virginia to Washington. It is his purpose to map out an All-Southern Trans-Continental route which can be travelled when other lines are blocked by snow and ice, and he should be induced to follow the line of the Southern National Highway if such a thing is possible.

* * *

Hon. Sidney Suggs, state highway commissioner of Oklahoma, is a good speaker. He knows how to give a humorous twist to everything, even to a good roads speech, and when he gets to going good on the doings of the Oklahoma legislature that tried to legislate him out of office, he is at his best. Addressing the delegates attending the meeting of the Ozark Trails Association at Monte Ne, Ark., last month, he paid his respects to these gentlemen:

"If I could have secured a fair shot at that bunch, I would have sent half of them to the asylum," said Mr. Suggs. He declared that since statehood Oklahoma had spent four million dollars for good roads and had accomplished nothing. The legislature was hostile to him, he said, because he favored building roads with home labor and material instead of buying steel bridges and culverts from the Steel Trust.

Any legislature that tries to legislate Colonel Suggs out of office to hinder or thwart his efforts for the betterment of roads in Oklahoma, is up against it.

* * *

Mr. George C. Diehl, an eminent good roads advocate of New York, member of Governor Sulzer's new state highway advisory board, has been gathering sta-

tistics of late, showing the comparative wear on the roads of France and those of the United States by reason of automobile travel.

The figures show the great need of substantial road building in this country since it has a great many more automobiles to its road area than France. The latter country finds necessity for a great deal of road repairing, although its roads are built of solid foundations started during the time of the first Napoleon.

The statistics show that France has a population of 38,000,000 people; 365,000 miles of roads and 75,000 automobiles; one automobile to each 520 persons and to each five miles of road. The United States has 90,000,000 people; 2,200,000 miles of road; 1,040,000 automobiles, or one automobile for every 87 persons and about two miles of road.

* * *

Maj. W. W. Crosby, Consulting Engineer of Baltimore, Maryland, returned on July 28th from the Third International Road Congress in London which he attended as a permanent member of the Association and as a delegate from the American Society of Civil Engineers and of the American Road Builders' Association. Maj. Crosby was made vice-president of one of the sections of the congress and was a United States Reporter on two of the subjects before it viz: The Construction of Bituminous Bound Roads, and the Terminology of Road Construction and Maintenance.

In connection with the latter subject, which has attracted international attention, Maj. Crosby has been asked to assist the British Committee which is about to work on the subject.

* * *

There are those who regard highway improvements as a matter of interest principally to motorists, forgetting that it is of greater interest to farmers and all teamsters. Suburban Life gives some interesting figures in regard to the subject in the following:

"Until very recently the vast majority of people failed to understand that the good road is not merely a convenience, but that it is an actual economic necessity. That it costs the farmers of this country more for a ten-mile haul of produce from farm to town than it does to ship that produce from New York to London is a fact. That it costs farmers abroad from one-half to one-tenth as much to haul a ton a mile on a road as it does the farmers of this country is another fact. That practically every pound of meat and bushel of wheat we consume must travel over a road at least once and sometimes twice before we eat it is a third fact. The three are the answer to one part of the question, 'Why is the cost of living so high?' Someone has to pay for the expensive hauling. Someone has to pay for the depreciation in the value of the horses and vehicles caused by poor roads. Someone has to pay for the extra time it takes to haul cotton to market when two mules are required to haul two bales ten miles in one day, when on a good road the same two mules could haul twenty-four bales in the same time with the same effort."

* * *

The late Senator Heyburn, of Idaho, once had this to say of the way the government should undertake the building of roads: "When the government enters upon this class of work it should be for the construction of roads up to the standard of the highest use, not all at one time, but continuously and gradually; not roads one part of which would be worn out before the other was constructed, but a system of progressive construction that would result within a reasonable time in a system of permanent good roads."

GOOD ROADS NOTES

GATHERED HERE *and* THERE

Alabama.

The Birmingham Ledger says that the opinion of the leading lawyers of Alabama is that the state constitution will have to be amended before convicts can be worked on the roads and a movement is expected to be inaugurated at the next meeting of the executive committee of the Alabama Convict Improvement association to have the next legislature submit a constitutional amendment which will allow the working of convicts on the roads.

Section 93 of the state constitution reads as follows: "The state shall not engage in any work of internal improvement."

When the good roads advocates in 1907 sought to change the constitution so as to permit the state to establish a highway commission the following change was made in the constitution in the amendment voted for by the people:

"Provided, that the state may under appropriate laws cause the net proceeds from the state convict fund to be applied to the construction, repair and maintenance of the public roads."

The people ratified this amendment in 1908, but the legislature has not yet deemed it advisable to put into effect the plan authorized by the amendment. The failure of the legislature to put this amendment into effect is probably due to the depleted condition of the treasury.

It is now generally admitted that in order to remove the state convicts from the mines, the lumber camps, the cotton mills and the farms, and place them on the roads, a constitutional amendment is necessary. This amendment would have to be submitted by the legislature of 1915, voted on in 1916 and the legislature could not then put the amendment into effect sooner than 1919.

At best, it would take from six to eight years to effect the change that the convict improvement association is working for.

In the meantime the sentiment is rapidly growing throughout the state to bring about a more humane treatment of the convicts. This is taking form in the movement to remove the shackles from county convicts that are worked on the public roads.

* * *

Arkansas.

The Ozark Trails Association was organized at Monte Ne, Ark., last month. The gathering of good roads enthusiasts that formed the organization was the largest of its kind that have ever assembled in the state of Arkansas and enthusiasm throughout the sessions was unbounded. There were 300 delegates present, representing Arkansas, Oklahoma, Missouri and Kansas. The association laid plans for the building of 1,500 miles of auto trails through the Ozark country.

M. J. Kelly, president of the Commercial Club of Neosho, Mo., was chosen president, and Charles W. Fears, editor of the Southwestern Automoblist, of Joplin, Mo., secretary. In addition to these officers each of the four states elected a vice president.

W. H. ("Coin") Harvey, originator of the Ozark Trails, was elected vice president for Arkansas; Chas. Churchill, of Vinta, vice president for Oklahoma; W.

J. Caney, of Chanute, for Kansas, and Charles Fleming, of Monnett, for Missouri. The vice presidents and the president will compose the executive committee.

The association plans to raise \$5,000 annually through dues to be paid by members. This will be used in the promotion of good roads and their protection after they are built, but the association will not contribute financially to the actual building of good roads. It will, however, offer \$2,000 in prizes yearly for the best pieces of road built within its confines. The territory to be embraced by the association consists of from 10 to 12 divisions, each division having a road to be marked every half mile with a white sign board bearing the words "Ozark Trails." The route runs as far north as St. Louis, west as far as Oklahoma City and Wichita, Kan., south as far as Rogers and east to Monte Ne.

The association will meet twice each year. The next meeting probably will be held at Joplin, Mo.

* * *

Florida.

The following paragraphs, clipped from Florida newspapers, show the spread of good roads sentiment in that state:

Now, that the county is bonded for hard roads, the parties who handle the money and who will superintend the construction of the roads should exercise very good judgment, indeed, in the way the funds are spent and should see that the greatest number of the people of Nassau county are benefitted by the issue.—Callahan Leader.

There are few newspapers in Florida at this time that do not have items of news concerning road building, either now being done or in immediate prospect. It is amazing to know the present extent of road building operations in the state. The Tarpon Springs Progressive calls attention to the fact that Pinellas county is now spending \$370,000 for hard roads; that Pasco has appropriated \$150,000 for the same improvement, and then comes Hernando with \$100,000 for the development of a hard road system. Hillsborough is now figuring on a \$1,000,000 bond issue for brick roads. These counties along the southwest gulf coast are showing a spirit of progressiveness that insures prosperity and wonderful development.—St. Augustine Record.

A movement is on foot looking toward the issuance of bonds in this district for the purpose of building brick or other good roads throughout its territory, which extends from St. Johns county line on the north to near Port Orange on the south, and about half way over to the St. Johns river on the west. It is proposed to call a preliminary meeting some time next week for the purpose of ascertaining the sentiment of the people interested and get the matter in shape so as to present it to the county commissioners at their meeting in August. The people of Ormond, Holly Hill, Kingston, Seabreeze, Daynota Beach, Daytona and Port Orange are all vitally interested in this matter of good roads and how to procure them, so they should see to it that they are well represented at this coming meeting.—Daytona Journal.

Georgia.

The bill of Representative Slater, of Bryan county, Georgia, by which the state will be authorized to furnish 100 convicts to the counties of Chatham, Bryan, Liberty, McIntosh and Wayne, or Glenn, for the purpose of building a highway to the Florida line which will connect at Savannah with a national highway from Toronto, Canada, and at the Florida line will meet the Miami highway, has been reported upon favorably by the judiciary committee of the house of representatives.

Representative Blackburn has introduced a bill by which a highway commission is to be formed in Georgia and this has been reported upon favorably. Friends of these two bills claim that they will mean more for the development of Georgia roads and consequent good of the rural and city population than any other act which is to come up.

The Georgia legislature, now in session, promises to be live and progressive and much forward-looking good roads legislation is in prospect.

* * *

Illinois.

Governor Dunn, of Illinois, has vetoed the appropriation of \$300,000 out of the general state funds for good roads for the year beginning the first of this July. He did not do this through any antagonism to the principle of state aid, but on the ground that the work will not be sufficiently advanced to spend this much money during the coming year. The \$300,000 for state aid to roads from the general fund for the second year—from July 1, 1914, to July 1, 1915—stands and also the \$400,000 for each of the next two years out of the automobile fund. This will make the large sum of \$1,100,000 available for road improvement. It is a great start in the work of hard road construction through state encouragement and puts Illinois in the line with other states in getting out of the mud. With a judicious use of this sum a beginning should be made that will justify further aid, along with the growing automobile fund, and a steady progress toward a splendid system of highways.

* * *

Louisiana.

The New Orleans Picayune prints a map showing the state road system planned by the engineers of the Louisiana state highway department. The map shows that there will be connecting roads from every parish seat to every other parish seat. Also cross-country roadways are expected to be built to facilitate overland commerce and serve the planters.

The entire proposed state road system is approximately 4,500 miles in length and will make a perfect web-work over the state. This survey, which has been completed, has adhered as nearly as possible to the government movement for connecting national highways. The national highways as proposed in Louisiana will consist of 1,450 miles, 170 miles of which have been included in the state survey.

The national highways, which are becoming a very live topic throughout the country, will be prominent in Louisiana if the system is carried out.

The New Orleans-Shreveport road, about 400 miles in length; the New Orleans-Little Rock road, 360 miles long; the Vicksburg-Shreveport road, a cross-state road through the northern part of the state; the Baton Rouge-Austin road, 210 miles long; the New Orleans-Jackson road, 80 miles long; the Shreveport to Gulf road, 200 miles long.

The state roads will not be as wide as the national roads, which will probably be about fifty feet

in width. But along the line of the proposed national highways the state roads will be graded up to meet the requirements of the national government.

* * *

Missouri.

The Kansas City (Mo.) Star says that the policy of the Jackson county court in awarding road contracts to the lowest bidders and inviting open competition in bidding has saved Jackson County \$85,000 in the seven road contracts awarded so far. The cost of macadam eighteen feet wide and ten inches thick is about \$6,000 a mile, all finished and ready for travel. It was almost twice that under the old system of "special privilege" and "political pulls," and the specifications did not call for such a good road, either.

Contracts have been awarded by the court for fifty-five and fifty-nine cents a square yard, while the former bids of the road combine contractors was ninety-four and ninety-eight cents a square yard, and the county highway engineer's office estimated the cost as high as \$1.03 a square yard as a price fair to both the contractor and the county. The \$85,000 saving to the county is not figured on this high estimate by the engineer's office, but on the lowest bid, which was ninety-four cents, submitted by the road combine contractors as a fair price.

* * *

New York.

Hon. John N. Carlisle, head of the State Highway Department of New York, appears to be revolutionizing road-building in the Empire State. With the aid of Governor Sulzer he has eliminated all graft and is building up an organization that will doubtless be the most efficient good roads machine in the nation. Concerning the mistakes of the past and the future policy of the department, Mr. Carlisle recently had this to say:

"In carefully investigating the whole highway situation in this state with particular reference to the proper maintenance of improved highways, we have found that the state has made what I consider to be a huge mistake. The good roads system planned by the legislature and to which the state is committed and for which bonds have been authorized by the people require the improvement of 12,000 miles of highways. Aside from this initial expense of the constructive work and which will not be covered by the bond issues already authorized, our engineers have estimated that after these highways are improved it will require a fixed annual appropriation of \$25,000,000 to maintain them.

"It's too great a burden even for the great state of New York. No such amount of mileage ever should have been planned. The people of the state never contemplated that this scheme of highway improvement covering all the little crossroads would mean a tax of \$25,000,000 a year for maintenance. This is an example of the lack of careful study and investigation that has characterized the highway work in this state, and we do not propose to make any of these mistakes if we can avoid them.

"If it had been planned to construct 5,000 or 6,000 miles of purely state roads, that is all that the state should have taken upon itself to do because the cost of maintenance is a tremendously big item. With such a plan to start with, we could build the highway from New York to Buffalo, the great highways through the southern tier and to the north, connecting all the arterial or radial highways and giving the farmers broad, well built roads to all their markets.

"The frightful waste of the people's money through

the highway department was due in large measure to a lack of preparation and study, recklessness, incompetency and careless disregard for what was really to be obtained for the money spent. The result is that millions have been spent building roads that have gone to pieces and must be reconstructed.

"The advisory engineers on their tours of inspection through the state have checked a good deal of this reckless and unscientific work. As a result of their reports a number of contracts have been cancelled because it was apparent that the roads that were being built would go to pieces immediately or because they were not of proper width.

"I am not going to be a party to the construction of a single mile of road in this state unless careful, technical consideration has first been given to the necessities of the traffic and the proper material and type. We want to build only roads that will be permanent. A cheap road that blows away in a season is false economy. This is a tremendous constructive work that the state has undertaken. The people have cheerfully voted money for it. To enter upon this task carelessly, without preparation and study and a definite notion of results would be a sinful thing to do. The policy of the department is the very opposite and every man in it has been so advised."

* * *

North Carolina.

Governor Craig, who completed a tour of the Central Highway on the 30th, of last month, had this to say of the road situation in the Old North State on his return to Raleigh earlier in the month from a long stay at Asheville:

"The improvement in roads in the state has been phenomenal. On the 7th of June I left Raleigh in an automobile for Asheville, and went in the car as far as Kings Mountain. There I had to abandon it on account of the heavy rains.

"The road from here to King Mountain, with the exception of a few miles, is fine. The worst road that you find is in Davidson county, and it is hoped that the people of Davidson will wake up to the necessity of having good roads, as about every other county in the state has. There is no better county in North Carolina than Davidson county. The land is fine, and some of the wheat fields, as I passed along on June 8th were beautiful.

"There are splendid roads in Durham, Alamance, Guilford, Rowan, Cabarrus and Mecklenburg. The finest road that I have ever travelled over is between Newell and Charlotte. This is the era of improved highways. It is a delight to travel over such roads. Wherever you have fine roads, you have fine farms, improved homes, new school houses and good churches.

"We expect to begin work on the side of the Blue Ridge in McDowell county very soon. This is a link of the National Highway. By the time this is completed every portion of the National Highway from here to Asheville will be the finest kind of a road. A person can then go in his automobile, and get to the mountains through a beautiful picturesque country, culminating in the magnificence of mountain scenery and mountain climate.

"About the whole of North Carolina is enthusiastic on the building of roads. Within a few years we will have improved highways in every county in the state. They will contribute immensely toward the material development of the state and above all to the improvement of conditions in the rural districts."

Ohio.

One of the most perfect organizations in behalf of good roads in the history of Ohio is now being formed. Probably it won't be excelled by any other state in the Union. It will reach its tentacles into every nook and corner of the state and it will endeavor to enlist the aid of every person interested in better highways and byways. The organization work is being done by the state federation of good roads.

Representatives are being sent into every county and city and village in the state to form local bodies and ultimately it is the intention to cement the local bodies into one general association. The aim of the movement is to give encouragement to the market roads movement already given a powerful impetus by the action of the recent general assembly in voting a tax levy of one-half of one mill annually for good roads.

With the approval of the public it is the intention during the next ten years to improve something like 100,000 miles of roads in Ohio. About one-fifth of this number comprises main market roads. They are the principal arteries of transportation and travel throughout the state. It is for their improvement that the tax levy will be expressly used.

The rest of the roads are to be improved at the discretion of the commissioners of the various counties and the trustees of the various townships. The new levy does not afford them specific aid, but encourages the local authorities to perform their part in road building by setting a salutary example on the market and inter-county thoroughfares.

The state federation believes that the people in the various parts of the state should encourage their officials to keep step with the road improvement progress of the state. The one-half mill levy in ten years is expected to raise nearly \$40,000,000 for good roads. The results promised are manifold. They include cheaper food through cheaper transportation, a better social life through the easier means of travel, a revolution in farm life through easier facilities of inter-communication, and an almost complete abridgement of the gulf now existing between farms and cities.

* * *

Texas.

The Texas Good Roads Congress held at Corpus Christi last month brought together a big crowd of good roads enthusiasts from all parts of the state. The attendance was unusually large. The congress pledged every delegate to the principles set forth in the following statement:

"We favor first the building of rural roads leading from farms to towns, and, second, trunk roads leading from town to town, and then from city to city.

"We believe that every intelligent citizen of Texas favors good roads and hesitates about voting the means to build them only when he doubts about the ability of our county authorities to get a dollar's worth of road for a dollar, and to meet this objection we favor the passage of a state highway bill, providing for a department in our state government to furnish the necessary information and expert assistance to all counties applying therefor and we direct our secretary to send a certified copy of this resolution to our governor, with request from this body to submit to the legislature at the next called session this subject for their consideration.

"We recommend that the method of condemning property for road purposes, either to drain, widen or straighten an existing road, or to secure material in proximity thereto for building and repairing a road,

be so changed as to simplify same to the end that said property may be taken upon an award by a jury after notice to the owner of person in charge and upon the deposits of the damages with the county treasurer, subject to the order of the owner of said property. This we recommend for the reason that the delays occasioned by the steps necessary to be taken by the present statutes is the cause of many roads being improved which are not of sufficient width.

"We recommend to the legislature the passage of a statute authorizing two or more counties to agree to jointly purchase such improved road machinery as may be advantageously used by both and to authorize counties owning road machinery to lend or rent same to other counties when not in use.

"We believe that the people should be encouraged by state and national aid in building good public highways by a wise assistance, at a time when any community or section is ready and willing to do its part. However, in this connection we recommend to the careful consideration of each community and all counties who are working for good roads, the story of the farmer and the larks.

"We recommend the formation by the people of road societies in precincts, in counties, along main highways and the assembling together at stated times for discussions, combining such social features as will entertain and attract good attendance to the end that more interest be aroused in road building, believing the old adage that 'where there is a will, there is a way.'

"We hold it to be the patriotic duty of every professional and business man, including lawyers, doctors, teachers, preachers, priests, rabbis, bankers, merchants, farmers and every class of citizens in communities where the question of a bond issue for road use is up for discussion and vote, to thoroughly get posted and show an interest by getting out among the people and working for the reason that we believe there is no room in a community for a lazy or a selfish man."

* * *

Tennessee.

Roads between important centers of population are now recognized as necessities and are demanded as essential to greater prosperity by states which have awakened to real highway progress. Coupled with it is the call for a better type of construction for these main roads, for not only are good roads required, but they must stay good for a period of time which will justify their building.

One of the most recent examples of this understanding, observed by the A. A. A. National Good Roads Board, emanates from Tennessee, where a concrete road is being projected between Chattanooga and Knoxville. The primary movement for this highway was inaugurated by the Chattanooga Times; it was then taken up by the Chattanooga Chamber of Commerce and the Knoxville Board of Commerce both working in conjunction. Then the cities and counties along the route became enthused, and the work is proceeding as rapidly as the conditions permit.

A first class road between the two Tennessee cities will form an important link. From Chattanooga several improved roads will lead into Alabama and Georgia, and others are being projected into Mississippi and Louisiana. From Knoxville to Bristol, Va., there is already a good road, and a link is now being constructed from Bristol to the Shenandoah Valley road which is the present outlet to Washington and the north. Another movement is for a main highway from Chattanooga to Louisville, Ky. C. E. James, of Chat-

tanooga, states that this road will be built in two years if Kentucky does its part. Mr. James at his own expense, has built from Chattanooga to the top of Signal Mountain, a permanent road which forms part of the route and takes care of the heaviest portion of the construction. The routing in Tennessee will be about 135 miles shorter than any other between Louisville and historic Chattanooga.



The commissioners of St. John county, Florida, have available for road and bridge work about \$70,000. Several new bridges are to be built soon.

A bridge is to be built across the Red River at Denison, Texas, to cost \$45,000.

The city of Houston, Texas, will spend \$400,000 in repairing bridges and building new ones within the city limits.

Baltimore county, Maryland, is building a bridge across Gunpowder river at Loch Raven, to cost approximately \$75,000.

Washington and Alleghany counties, Maryland, are planning to construct two bridges across Sideling Hill creek, which separates the two counties.

Lenoir county, North Carolina, has rejected bids for the construction of a steel bridge across Neuse river and is asking for new bids. The bridge is to be 300 feet long and have concrete piers.

The bridge commission of Davidson county, Tennessee, will construct six concrete bridges.

The city of Houston and Harris county, Texas, will build a temporary bridge across the channel at the San Jacinto crossing to cost \$8,000. A permanent structure will be built later, to cost about \$125,000.

The Charleston district of Jefferson county, West Virginia, is planning the construction of a bridge across Shenandoah river at Bloomery to cost \$35,000.

Hale county, Alabama, has contracted for the construction of three fine bridges.

Wilcox and Dodge counties, Georgia, will ask for bids for building a bridge across the Ocmulgee river to cost about \$20,000.

The commissioners of Bibb county, Georgia, have rejected bids for seven bridges and will call for new bids.

The police jury of Richland Parish, Louisiana, has appropriated \$5,000 for a bridge across Bouef river. This amount is to be supplemented by an additional \$5,000 to be voted at an election to be held soon.

The commissioners of Brunswick county, North Carolina, have available \$40,000 to build a bridge across Brunswick river, opposite the city of Wilmington. The bridge is not to be built unless New Hanover county, in which Wilmington is situated, will vote bonds for \$250,000 to bridge the Cape Fear river.

The commissioners of Tillman county, Oklahoma, have \$25,000 to be spent in building new bridges and repairing old ones. Five new bridges will be built.

The towns of Rogers and Villas, in Bee county, Texas, are to be connected by a bridge over Little river to cost \$4,000.

The city of San Antonio has available for bridge and culvert building \$100,000.

GOOD ROADS NOTES IN BRIEF

Road district No. 2, Smith county, Texas, according to reports from Tyler, will construct about 250 miles of macadamized, graveled and paved roads.

Russel county, Virginia, has voted bonds for \$150,000 for road-building.

Edgecombe county, North Carolina, joined the ranks of the good roads counties of the Old North State last month by voting a bond issue of \$200,000 for road-building.

In district No. 2 of Montgomery county, Texas, bonds have been voted for \$250,000 for road-building.

The town of Mooresville, North Carolina, has voted \$65,000 of bonds for street improvement.

Spartanburg, South Carolina, has voted bonds for street building to the amount of \$100,000.

The city of Tyler, Texas, has voted bonds for \$300,000 for a system of streets.

Florence county, South Carolina, votes this month on a bond issue of \$500,000 for road building.

Lee county, Florida, will vote soon on a \$200,000 bond issue for road-building.

The town of Rockport, Texas, will vote on a bond issue of \$155,000 to build a road and causeway across Capano bay.

Anderson, South Carolina, has contracted for 100,000 square yards of paving.

De Soto county, Florida, has had preliminary estimates made for the construction of about 230 miles of roads. The estimated cost of the road system is \$570,000.

Hamilton county, Tennessee, will build a road to Lookout Mountain to cost in the neighborhood of \$65,000.

LeFlore county, Mississippi, has let contracts for the construction of 25 miles of roads.

Green county, Arkansas, has \$80,000 available for the construction of 29 miles of road.

Augusta county, Virginia, will build 8 miles of macadam road.

The town of Belton, Texas, has voted \$45,000 of bonds for street work.

Houston, Texas, has voted bonds for \$800,000 for street extension and improvement.

Calcasieu parish, Louisiana, votes on the 21st of this month on a bond issue of \$900,000 for road building.

The city of Shreveport, Louisiana, will hold an election this month on the question of issuing bonds for \$101,500 for roads and streets.

The city of Baltimore, Maryland, has contracted for vitrified block and granite block paving amounting to \$61,500. Contracts have also been let for about 12,000 square yards of bituminous concrete pavements.

The town of Ocmulgee, Oklahoma, has contracted for bituminous concrete paving to cost \$72,000.

County Road Improvement District No. 4, of Jefferson county, Arkansas, has let contracts for the construction of 22¼ miles of road.

In district No. 3 of Navarro county, Texas, bonds have been voted for \$75,000 for roadbuilding.

Brogden township, of Wayne county, North Carolina, has voted \$40,000 of bonds for roads.

The city of Wichita Falls, Texas, will pave two miles of Tenth street with asphalt or wooden blocks.

Matagorda county, Texas, will build 15 miles of shell road with the proceeds of a bond issue of \$100,000 to be voted soon.

The town of Rockingham, North Carolina, has avail-

able from the sale of bonds, \$30,000 to spend on its streets.

At Vicksburg, Missouri, Levee street is to be paved with creosoted wood blocks at a cost of \$65,000 by the Yazoo and Mississippi R. R., and the Illinois Central.

Goldsboro township, Wayne county, North Carolina, has available for road work \$100,000 recently voted in bonds.

The city of Bartow, Fla., has voted bonds for \$50,000 for street improvement.

Navarro county, Texas, has voted bonds for \$75,000 for road work.

Unicoi county, Tennessee, will start road improvement with a bond issue of \$50,000 voted recently.

A news dispatch from Fernandina, Florida, brings the information that Nassau county has voted roads bonds to the amount of \$180,000.

Bradley and McMinn counties, Tennessee, have just completed a fine new bridge across the Hiawassee river, connecting the suburbs of Charleston and Calhoun. The bridge cost \$30,050.66 and the cost was divided equally between the two counties.

The commissioners of Galveston county, Texas, have ordered an election to be held on September 26th to decide on a bond issue of \$250,000 for extending the good roads system of Galveston county. If the issue carries, the county of Galveston will have appropriated \$750,000 for the building of roads.

At the July term of the county court of Loudon county, Tennessee, the matter of issuing \$150,000 of bonds for road building under an act recently passed by the state legislature was taken up and a lively debate followed. All of the justices of the county were present and the bond issue carried by a vote of 7 to 5. Messrs. C. H. Bacon, J. J. Duff and J. A. Beals were elected road commissioners. It was announced that the county court would make an effort to secure government aid to the amount of \$10,000 in constructing a main thoroughfare from the Monroe county line on the south, to the Knox county line on the north. This road will form a part of the Chattanooga-Knoxville Highway. This is Loudon's second bond issue, the first being for \$100,000.

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Items of Interest

Hinds county, Mississippi, has awarded contracts for the building of twenty miles of good roads in the first and fifth districts.

Wetzel county, West Virginia, voted \$150,000 of bonds for road work last month. This makes \$200,000 available immediately for the building of 200-mile road system already mapped out.

The city of San Antonio, Texas, always moving forward, has voted bonds for \$1,500,000, the money to be used in improving the streets of that city.

Bossier parish, road district No. 7, in the region of Shreveport, Louisiana, has made provision for a bond issue of \$175,000 to build 40 miles of roads.

The city of Orlando, Florida, will vote on the 19th inst. on a bond issue of \$100,000 for street paving.

Supervisors' District No. 2, Lowndes county, Mississippi, has been asking for bids for the improvement of 20 miles of road.

Attalla county, Mississippi, has available for road work \$50,000.

Montgomery county, Alabama, will receive bids until August 18 for grading and gravelling eight miles of road.

Nueces county, Texas, will vote September 2 on a bond issue of \$165,000 to build a bridge across Nueces bay, connecting the mainlands of Nueces and Patricio counties.

The McLennan county, Texas, commissioners will spend \$7,500 on two bridges near Waco.

Surry county, Virginia, will construct three costly bridges across Blackwater river, near Dendron.

A movement is on foot at Parkersburg, West Virginia, to bridge the Ohio river at a cost of about \$450,000.

Arthur H. Blanchard, M. Am., Soc. C. E., Professor of Highway Engineering in Columbia University, has returned from Europe, where he attended the London Congress of the Permanent International Association of Road Congresses as a delegate from the State of New York and several societies. After the adjournment of the congress, Professor Blanchard made an investigation of the various pavements and roads in England, France and Germany.

An indication that the "signs of the times" favor better and more durable road construction, is found in the report of the board of consulting road engineers recently appointed by Governor Sulzer, of New York State, to examine into the condition of existing contracts. On two state highways where the work has not yet reached the surfacing stage, the committee found 146 miles of road where, to carry out the original contracts, would be to practically waste the money. An upper course of first class material, probably concrete, is the only method by which the money already put in can be saved.

According to many leading road engineers, too much emphasis cannot be placed on the importance of a type of construction that will stand the stress of the constantly increasing traffic. Motor trucks carrying

heavy loads are being put into use everywhere, and the roads must be built for durability under the combined light and heavy motor and horse traffic. For the main roads of the country, it is claimed, ordinary macadam has had its day. It has now become too expensive because of its short life. Economy as well as utility demands a higher type of construction.

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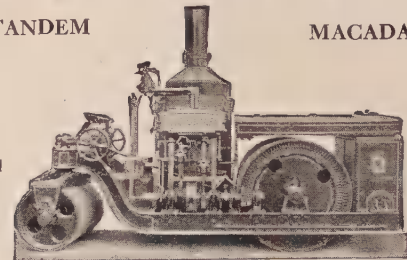
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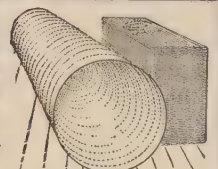


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The city of St. Louis, Missouri, contemplates the expenditure of \$3,500,000 in building a system of bridges and culverts throughout its territory that will be sufficient for the city's needs for many years. An election is to be called to vote bonds.

The commissioners of Galveston and Harris counties, Texas, are considering the construction of a bridge across Clear creek to cost \$15,000.

Arthur H. Blanchard, M. Am. Soc. C. E., Professor of Highway Engineering in Columbia University, has been retained as Consulting Highway Engineer by the Department of Efficiency and Economy of the State of New York.

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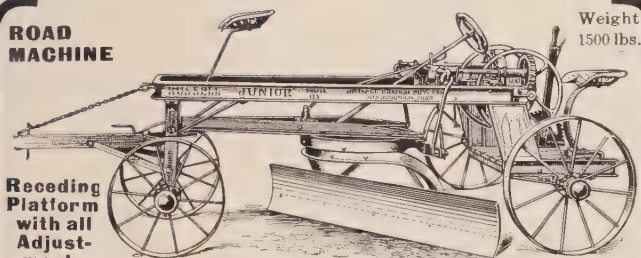
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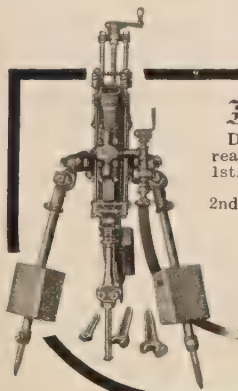
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ROAD-BUILDING and county officials will find Red Cross Dynamite a cheap and able assistant for digging drainage ditches, shattering hard-pan under highways to drain them, clearing stumps and boulders, and for other purposes usually requiring expensive labor and equipment.

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The Railway of Helpful and Progressive Policies

Identified as it is with the Southeastern Section of the United States, it is the purpose of the management of the Southern Railway Company to make its policies as helpful as may be practicable to the people of that Section.

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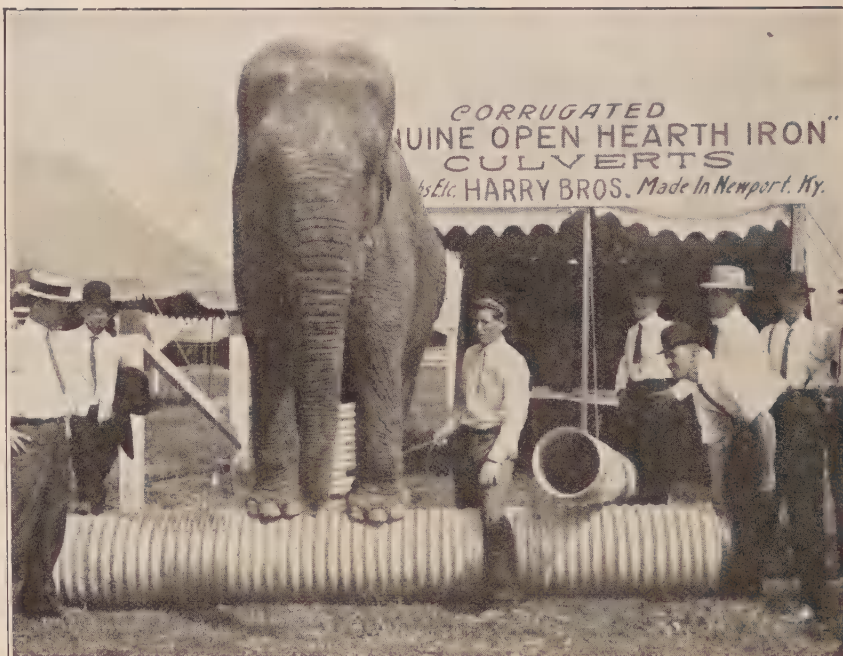
All of the co-operative development work of the Southern Railway Company is free to all persons in the territory traversed by its lines who may wish to avail themselves of it.

On matters relating to Southern development, or farm and factory openings, call on or address

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We announce with no little pride, that we secured the exclusive contract to furnish the culverts for Orange County under their present bond issue for road work. The use of our Culverts in the county where so many young Highway Engineers receive their training is, we feel, quite an honor. And especially is this the case where such men as Dr. Joseph Hyde Pratt, R. T. Brown and others of the same calibre have the road building in their hands. May we figure with you on your next work?

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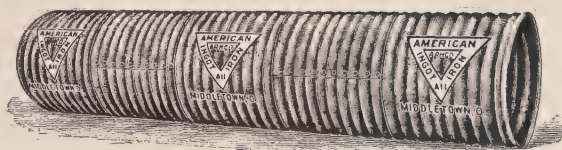
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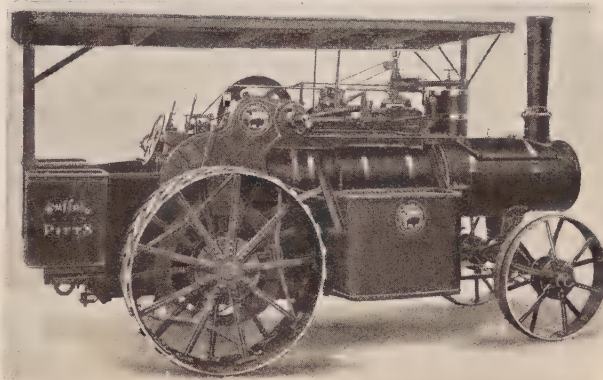
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BINDER "A." A semi-solid product to be applied hot over stone or gravel roads subjected to heavy automobile travel. A covering of sand or screenings is necessary after Binder "A" is applied.

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A full description of our various products, with specifications for correct use, is given in our illustrated Booklet, sent free upon request.

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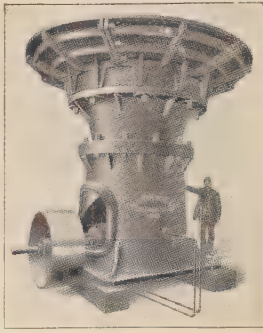
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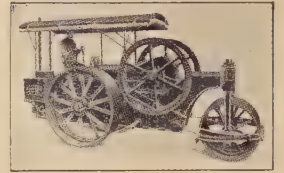
Austin Gyrotory Crusher



Giant Grader



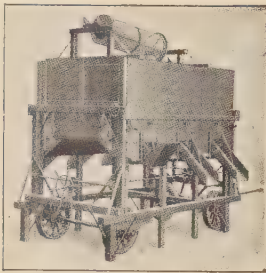
Elevating Grader



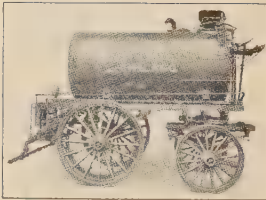
Austin Motor Roller



Aurora Rock Crusher



Aurora Bins and Screens



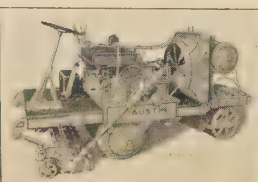
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The Austin = Western

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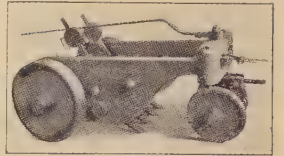
ROAD MACHINERY CO.

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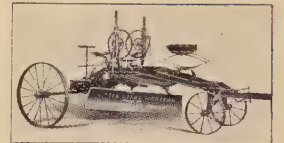
New York City
Dallas, Texas
Durham, N. C.

Syracuse, N. Y.
Atlanta, Ga.
San Francisco and Los Angeles, Cal.

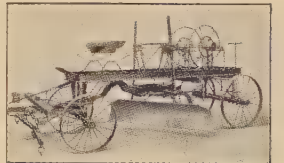
St. Paul, Minn.
Memphis, Tenn.



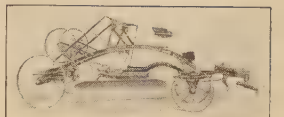
Austin Scarifier



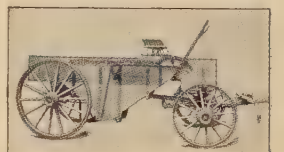
Little Western Grader



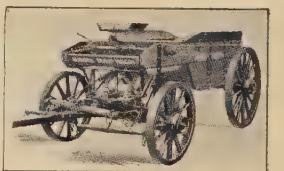
Western Grader



Austin Grader



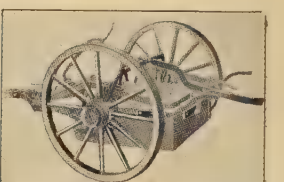
Austin Stone Spreader



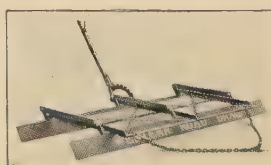
Aurora Dump Wagon



Austin Dump Wagon



Western Wheeled Scraper



Road Drag



Drag Scraper

American Road Congress, Detroit, Mich., Sept. 29-Oct. 4

SOUTHERN GOOD ROADS

A MONTHLY MAGAZINE DEVOTED TO HIGHWAY AND STREET IMPROVEMENT

Vol. VIII. No. 3.

Lexington, N. C., September, 1913

10c. a Copy



Macadam Road Two Miles West of Tazewell Court House, Tazewell County, Virginia

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SOUTHERN GOOD ROADS PUBLISHING COMPANY
LEXINGTON — NORTH CAROLINA

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**Sheet Asphalt
Asphaltic Concrete**

**Asphaltic Macadam
Penetration Method**

Has received the highest endorsement from asphaltic experts, contractors and engineers.

Is now being laid on heavy traffic streets of New York ; also laid in Philadelphia, Pittsburgh, Chester, Scranton, Erie, Rochester, Albany, Troy, Toronto, Detroit, Providence, Baltimore, Washington, D. C., Norfolk, Paterson, Passiac, Charlotte, N. C., and many other places.

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Great Cementing
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Is a road preservative and dust layer combined in one. It possesses the quality of thoroughly penetrating the interstices of the macadam roadway, leaving upon evaporation a hard asphalt which firmly binds the stone making a plastic surface.

It should not be confused with heavy residual sludges or ordinary dust layers. Is without a peer as a road oil and has given eminent satisfaction wherever used. Has been applied with excellent results to dirt and gravel roads as well as macadam.

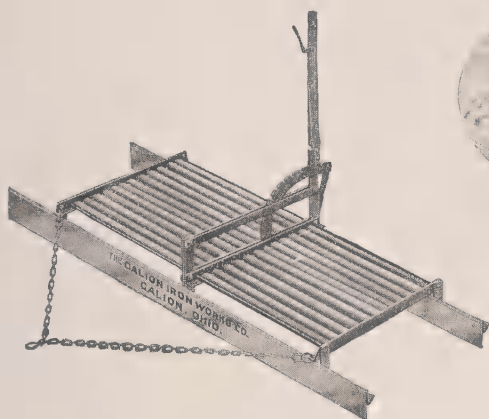
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Forty - seven different kinds Grader Blades.
Best Engine Grader, Steering Gear and Portable Stone Unloading Machine made.

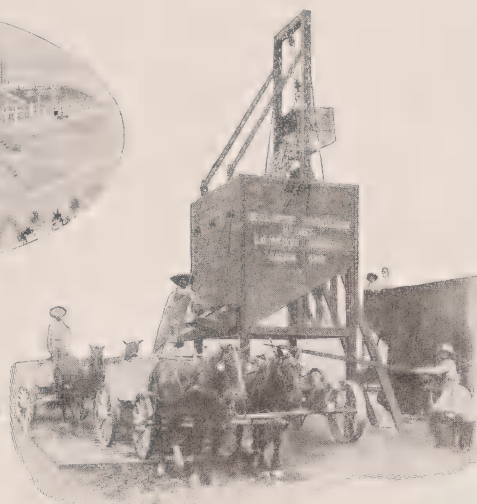
We supply everything for the road maker, and sell to you direct from factory.

Let us quote you on Rock Crushers, Engines, Rollers, Hauling Cars, Dump Wagons, etc.

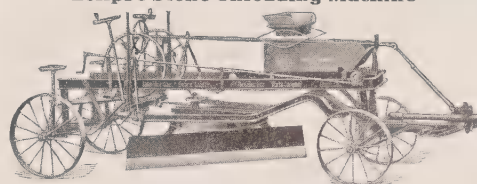
See our Exhibit of Culvert Pipe and Road-Making Machinery at the American Road Congress convention at Detroit, Michigan

Examine our line and see how its extra efficiency saves you money. Ask for our prices which also save you money.

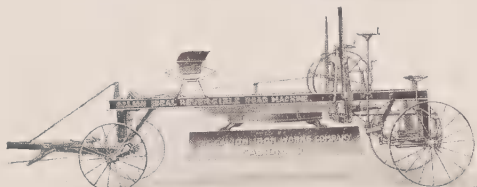
Our handsomely illustrated new catalog showing our entire line mailed on request.



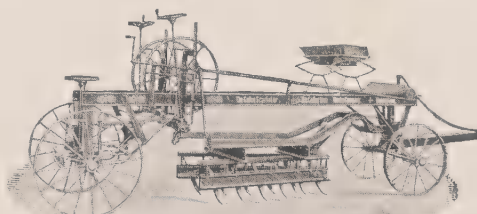
Eclipse Stone Unloading Machine



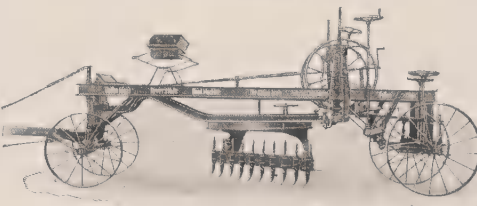
GIANT ALL-STEEL ENGINE GRADER Equipped with Ideal Engine Steering Gear



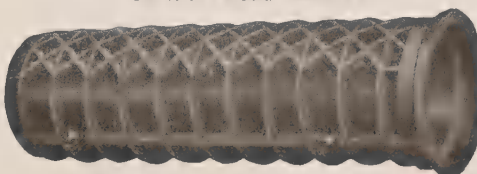
Galion Ideal Road Machine



Galion Ideal Scarifier



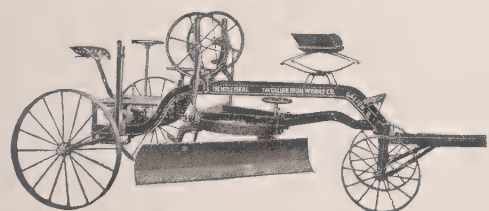
RELIANCE BAR SCARIFIER ATTACHMENT On Ideal Road Machine



Galion Ideal Cast Iron Culvert Pipe



Galion Standard Corrugated Culvert Pipe



Little Ideal Road Machine



New Imperial Road Machine

PERFECTION	TOTAL LENGTH 8 FT.
STEEL CHAMPION	TOTAL LENGTH 8 FT.
ROAD KING	TOTAL LENGTH 8 FT.
INDIANA (TWO PARTS)	TOTAL LENGTH 8 FT.
FT. WAYNE OR FLEMING (TWO PARTS)	TOTAL LENGTH 7 FT. 3 IN.
NATIONAL	TOTAL LENGTH 7 FT. 3 1/2 IN.
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Cutting Edges for All Makes of Road Machines

THE GALION IRON WORKS CO.

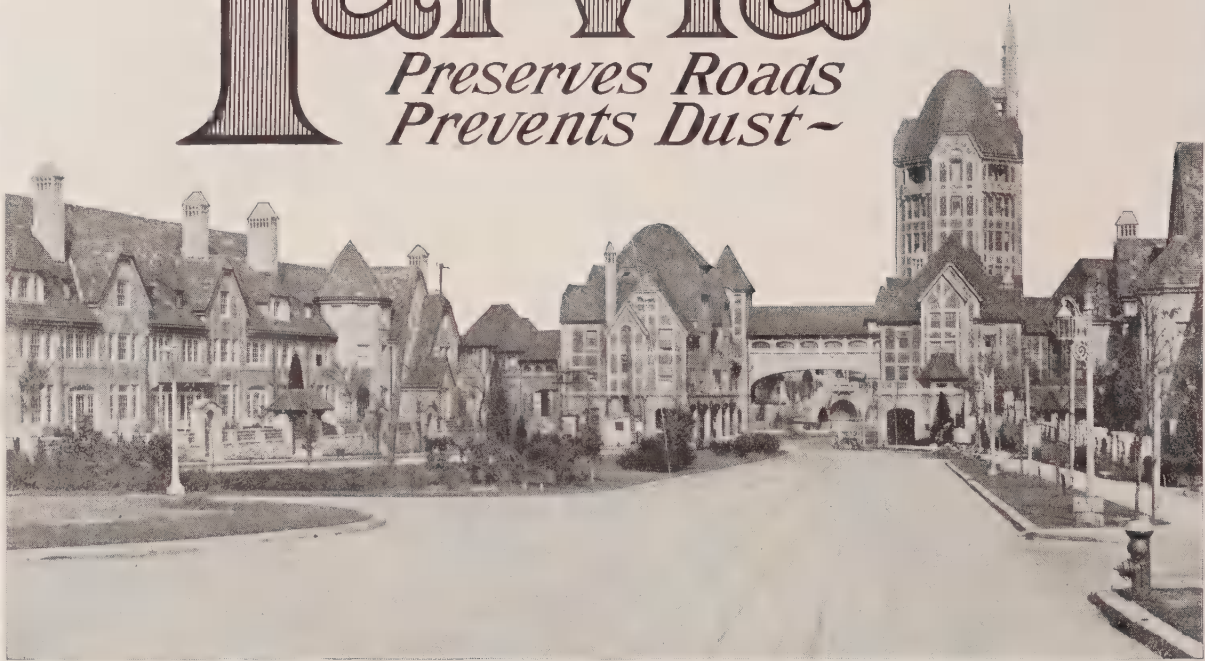
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Tarvia

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Prevents Dust~*



Sage Foundation Homes Co., Forest Hill, L. I. Constructed with "Tarvia X" 1910. Treated with "Tarvia B" 1913.

Dust is Expensive

WHEN an automobile speeds down an ordinary macadam road it leaves in its wake a cloud of dust which is carried by the winds over the neighboring fields, houses and lawns.

This is just as surely a waste of good material as if the automobilist dug material out of the highway and carted it away. Dust represents waste---costly waste---and the taxpayers feel the result. A road that is properly built for modern traffic will not be dusty.

Plain macadam gives way under the wear and tear of heavy rubber-tired automobile wheels and the surface binder of the road is

torn away in the form of dust, until in time the coarse stone itself is exposed and a costly renewal of the road is necessary.

Modern roads should be built to resist modern traffic. To build any other kind is wasteful. A better binder than the ordinary mineral binder is needed and is offered in Tarvia, a coal tar compound especially prepared for use on roads.

Tarvia is dense, viscid, waterproof. It fills the interstices between the stone and forms a tough, plastic matrix. This makes a waterproof and automobile-proof surface. The maintenance cost is usually so low as to more than balance the cost of Tarvia treatment.

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SOUTHERN GOOD ROADS

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Lexington, N. C., September, 1913

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Third American Road Congress at Detroit September 29-October 4

Twenty-four of the foremost organizations interested in good roads and the development of farm life have signed the official call for the Third American Road Congress to be held at Detroit, Mich., during the week of September 29. The call sums up in the following clear cut and impressive paragraphs the good roads situation throughout the United States and the reasons which actuate the holding of this great national convention:

Whereas, the rapid concentration of population in our large cities and the high cost of living are, in a considerable measure, due to bad roads which render farms inaccessible, transportation uncertain and costly, educational advantages limited, and social conditions unattractive; and

Whereas, it is estimated that the people of this country are annually expending on the public roads upwards of \$200,000,000, a large percentage of which, by reason of lack of system, ignorance of proper methods, and wasteful management, is not accomplishing results at all commensurate with the outlay; and

Whereas, the national government and the various state governments are now endeavoring to ascertain the character of legislation which will best accomplish a maximum of effective road improvement and maintenance coupled with a wise and efficient expenditure of the road revenues; and

Whereas, the increasing use of the motor vehicle has brought about problems of construction and maintenance of roads which are exceedingly difficult and for the solution of which the combined wisdom and experience of trained specialists are necessary; and

Whereas, the aroused public spirit of the people in behalf of the movement for better roads has found expression in the form of many organized bodies; and

Whereas, it is only by a correlation and co-ordination of efforts, and by an exchange of knowledge and experience that the greatest good can be accomplished;

Therefore, we, the undersigned, representing the organized road movement of America, hereby join in calling the American Road Congress to hold its sessions in the city of Detroit, State of Michigan, during the week of September 29, for the purpose of giving careful consideration to the subjects of road legislation, both national and state; the administration of public roads throughout America including states, counties, and the smaller subdivisions thereof, and the provinces of Canada; the problems of constructing and maintain-

ance; the financial questions concerned with road revenues and their expenditures; the advancement of highway engineering in educational institutions; and other questions, the consideration of which may be of practical aid to the betterment of the public roads of America.

American Highway Association—L. W. Page, President.

American Automobile Association—Geo. C. Diehl, Chairman Good Roads Board.

National Grange—Oliver Wilson, Master.

National Old Trails Association—J. M. Lowe, President.

Travelers Protective Association—E. B. Smith, National Chairman, Good Roads Committee.

Quebec-Miami International Highway Association—H. D. Hadley, President.

Omaha-Lincoln-Denver Good Roads Association—S. A. Searle, President.

Southern Appalachian Good Roads Association—Joseph Hyde Pratt, President.

Arkansas Good Roads and Drainage Association—W. A. Coker, President.

Greater Colorado Highway Association—E. E. Sommers, President.

Georgia Federation of Road Authorities—Wm. F. Eve, President.

Illinois Highway Improvement Association—W. G. Edens, President.

Indiana Good Roads Association—Chas. C. Brown, Secretary.

Kentucky Good Roads Association, Joe F. Bosworth, President.

Michigan State Good Roads Association—P. T. Colgrove, President.

Minnesota Roadmakers Association—John H. Mullen, Secretary.

New York Roadbuilders Association—John J. Ryan, Secretary.

North Carolina Good Roads Association—Joseph Hyde Pratt, Secretary.

Ohio Good Roads Federation—Jesse Taylor, President.

Virginia Road Builders' Association—C. B. Scott, President.

West Virginia Board of Trade, Good Roads Commissioner—Howard Sutherland, Chairman.

Wisconsin Highway Commissioners Association—H. J. Kuelling, President.

Twenty chiefs of state and national highway departments will personally take part in discussing ways and means of constructing and maintaining highways according to every known method and under all conditions. The sessions at which these distinguished good roads men will appear will be held under the auspices of the American Highway Association, which is looked upon as the national clearing house for the organized road movement of America.

Mr. J. E. Pennybacker, secretary of the congress, in explaining the arrangement of the program called attention to an innovation in the method of discussing the subjects that come before the congress. "Hereto-

arrangements have been made are the following:

"The Labor Problem in Road Construction," by Captain P. St. J. Wilson, State Highway Commission of Virginia.

Discussion to be opened by Mr. W. E. Atkinson, State Highway Engineer of Louisiana.

"Systematizing the Purchase of Road Materials and Equipment," by Mr. Henry G. Shirley, Chief Engineer, State Roads Commission of Maryland.

"Unsurfaced Roads," by Mr. W. S. Keller, State Highway Engineer of Alabama.

Discussion to be opened by Mr. George W. Cooley, State Highway Engineer of Minnesota.

"Gravel roads, their Construction, Maintenance, Cost and Special Treatment," by Hon. S. Percy Hooker, State Superintendent of Highways of New Hampshire.

Discussion to be opened by Mr. H. L. Bowlby, State Highway Engineer of Oregon.

"Treatment of Worn Out and Ravelled Macadam Surfaces," by Colonel E. A. Stevens, State Highway Commission of New Jersey.

Discussion to be opened by Hon. Robert C. Terrell, State Commissioner of Public Roads of Kentucky.

"Bituminous Macadam, Construction and Maintenance," by Mr. S. D. Foster, Chief Engineer, State Highway Department of Pennsylvania.

Discussion to be opened by Mr. W. A. McLean, Provincial Engineer of Ontario, Canada.

"Brick Roads," by Mr. James M. McCleary, County Engineer of Cuyahoga county, Cleveland, Ohio.

Discussion to be opened by R. Keith Compton, Chairman Paving Commission, Baltimore, Md.

"Concrete Roads," by Hon. Frank F. Rogers, State Highway Commissioner of Michigan.

Discussion to be opened by Mr. Paul D. Sargent, State Highway Engineer of Maine.

"Selection of Road Materials," by Hon. Logan Waller Page, Director, United States Office of Public Roads.

"Drainage Structures," by Mr. A. R. Hirst, State Highway Engineer of Wisconsin.

Discussion to be opened by Professor T. H. MacDonald, State Highway Engineer of Iowa.

"California's \$18,000,000 State Highway System," by Mr. A. B. Fletcher, State Highway Engineer of California.

"Highway Accounting with Special Reference to Maintenance," by Mr. Halbert P. Gillette, Editor-in-Chief, Engineering and Contracting.

"The Organization and Management of Working Forces," by Mr. A. N. Johnson, State Highway Engineer of Illinois.

"Contract Law," by Mr. William Bowman, of New York.

"The Protection and Upkeep of Road Equipment," by Mr. Daniel J. Hauer, of New York.

"The Merit System in Road Management," by Hon. J. A. McIlhenny, President United States Civil Service Commission.

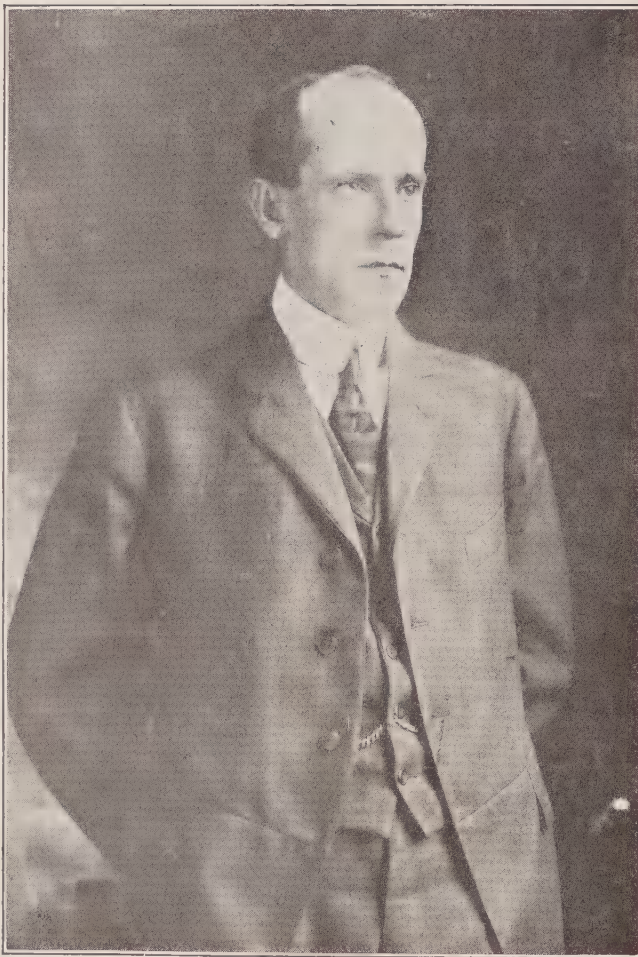
"Financing Road Improvement," by Mr. Wm. G. Edens, President Illinois Highway Improvement Association.

"Bond Issues for Road Improvement," by Mr. S. E. Bradt, Vice-President First National Bank, DeKalb, Ill.

"The International Congress and the Roads of England, France and Germany," by Col. Wm. D. Sohler, Chairman, Massachusetts State Highway Commission.

"Economics of Road Improvement," by J. E. Pennybacker, Secretary, American Highway Association.

"Dirt Roads and Politics," by Charles P. Light, former State Highway Commissioner of West Virginia.



HON. LOGAN WALLER PAGE
President American Road Congress

fore" said Mr. Pennybacker, "The set papers have all been read at the sessions and not published until after the congress had adjourned, thus making general discussion difficult both on account of lack of time and inability on the part of the audience to give sufficient consideration to the papers before entering upon discussion. This year we shall have all of the set papers printed in advance of the congress and read only by title. The general discussion will be opened by selected specialists of national reputation who will be provided with copies of the papers at least ten days in advance of the meetings. Copies of papers will also be distributed at the meeting so that everybody present will have ample opportunity to take issue on any of the conclusions presented.

Among the papers and discussion for which definite

Addresses by Hon. James H. MacDonald, Dr. Jos. Hyde Pratt, Mr. Clarence A. Kenyon, and others.

TENTATIVE PROGRAMME.

The day sessions of the congress will be held on the second floor of the Wayne Gardens. Evening sessions and special session of the various associations and committee will be held at the Hotel Pontchartrain and other hotels and will be announced at the sessions of the congress and by bulletins.

MONDAY, SEPTEMBER 29.

Registration.

9 a. m.—Continuing throughout the congress registration of members and delegates at Secretary's office, Wayne Gardens, where badges, program, cards, etc., may be obtained after registration. Blank forms for registration may be obtained at hotels or at Wayne Gardens.

10 a. m.—Meeting called to order in Wayne Gardens by Hon. Logan Waller Page, President of the congress.

Addresses by Hon. Woodbridge N. Ferris, Governor of Michigan; Hon. Oscar B. Marx, Mayor of Detroit; Hon. Logan Waller Page, President, American Highway Association; Mr. Laurens Enos, President American Automobile Association, and others.

Afternoon Session.

2:30 p. m.—The national administration will be represented at the congress by one or more members of the Cabinet and President Wilson has promised to write an address to be read at one of the sessions. It is expected that this address will be read at the afternoon session of the first day and that distinguished officials of the Canadian government will also take part in this session, concerning which definite announcements will be made later.

Social Features.

Plans are under way looking to the holding of a reception or garden party late in the afternoon of the first day in honor of the distinguished guests of the congress. This will be followed by a series of banquets and entertainments by the Board of Commerce, the Wolverine Club, the Rotary Club, the Adcraft Club and others.

TUESDAY, SEPTEMBER 30.

National Legislation, Under Auspices of American Automobile Association.

10 a. m.—Opening address by the presiding officer, Hon. Frank F. Doremus, M. C. (introduced by Mr. George C. Diehl, Chairman, Good Roads Board, American Automobile Association.)

Addresses on proposed national aid or national highways by the leading advocates of the respective measures which have become prominent. It is expected that among the speakers will be Hon. Jonathan Bourne, Jr., Chairman, Joint Congressional Committee on Federal Aid in the Construction of Post Roads; Hon. Claude A. Swanson, United States Senator from Virginia and member of the joint committee; Hon. Dorsey W. Shackelford, Chairman, Good Roads Committee of the United States House of Representatives.

Speakers representing the Lincoln Highway Association will occupy a portion of the program at this session.

This session will be thrown open to general discussion after the principal addresses and a committee on resolutions will be appointed which will confer with the distinguished advocates of the various plans of legislation in an endeavor to prepare resolutions which may be presented to the congress of the United States

as representative of the organized road movement of America.

2:30 p. m.—State Legislation and Road Management Session, Under the Auspices of the American Bar Association.

Committee—Frederick D. Wadhams, of Albany, Chairman; William D. Sohier, of Boston; Henry D. Estabrook, of New York.

Addresses will be given by Mr. William D. Sohier, Chairman, Massachusetts State Highway Commission, who will explain the lessons learned at the International Road Congress in London and present his observations of European road systems; an address on the Merit System in Road Management by Hon. John A. McIlhenny, President, United States Civil Service Commission; The Evolution of Road Legislation in Ohio, and its relation to Road Legislation in other states, by Hon. James R. Marker, State Highway Commissioner of



HON. J. E. PENNYBACKER, JR.
Secretary American Road Congress

Ohio; systematizing the purchase of road material and equipment by Mr. Henry G. Shirley, Chief Engineer, State Roads Commission of Maryland.

Social Features.

Special entertainments will be given in the evening by the manufacturers represented at the Congress, concerning which definite announcement will be made from the platform and by bulletin.

WEDNESDAY, OCTOBER 1.

Construction and Maintenance Session, Under Auspices of American Highway Association.

10 a. m.—Opening address by the Chairman, Hon. J. N. Carlisle, State Superintendent of Highways of New York.

Papers are listed elsewhere in this announcement, and they will be read by title only and followed by discussion.

Social Features.

A boat ride will be given in the evening to which all

delegates and members in attendance at the congress are invited.

THURSDAY, OCTOBER 2.

Road Users Session, Under the Auspices of American Automobile Association.

10 a. m.—Opening address by Mr. George C. Diehl, Chairman, Good Roads Board of the American Automobile Association, presiding.

Program to be announced.

2:30 p. m.—Finance Session, under the auspices of American Bankers' Association.

Mr. William G. Edens, of Chicago, Chairman.

Papers and addresses will be given dealing with the various phases of road finance and accounting by men who have made a special study of this subject. Among the papers will be one on financing of road improvement by Mr. Wm. G. Edens, President, Illinois Highway Improvement Association; Bond Issues for Road Improvement, S. E. Bradt, Vice-President First National Bank, DeKalb, Illinois; Highway Accounting with special reference to maintenance, by H. P. Gillette, Editor in Chief of "Engineering and Contracting."

(Other addresses to be announced.)

Evening—(To be announced.)

FRIDAY, OCTOBER 3.

Michigan Day, under the auspices of Michigan State Good Roads Association.

10 a. m.—Meeting opened by Chairman P. T. Col-

grove, President of the Michigan State Good Roads Association.

Addresses by Governor Ferris, Hon. Charles A. Townsend, United States Senate, who will speak on national legislation; Jesse Taylor, President, Ohio Good Roads Federation, on "Road Legislation and How to Get It;" F. F. Rogers, State Highway Commissioner, on "Concrete Road Building;" Mr. William Bryant, of Kalamazoo, Chairman, Good Roads Association of Kalamazoo county, will speak on "Prison Labor on the Roads of Michigan;" Mr. Frank N. Sparks, Editor Grand Rapids Herald, will present a paper on "Roads of Kent county and Western Michigan;" Mr. Frank Hamilton will speak on "West Michigan Pike Association." These addresses will be followed by five-minute talks.

Evening.—Meeting of the American Highway Association at Hotel Pontchartrain, for election of officers, consideration of reports, etc.

SATURDAY, OCTOBER 4.

10 a. m.—Presiding officer, Dr. Jos. Hyde Pratt, State Geologist of North Carolina.

Report by Committee on Resolutions and discussion.

Jackson county, Florida, has issued \$100,000 of bonds for the construction of a system of top-soil and sand clay roads.

The city of Orlando, Florida, has voted \$100,000 of bonds for street improvement.



A Beautiful Stretch of Gravel Road Between Stonesboro and Swann Station, Lee County, North Carolina. It Has a Gravel Surface 8 to 10 Inches in Depth and 16 Feet Wide. It is 30 Feet Wide From Gutter to Gutter

Slag in Highway Construction

By **SOLON JACOBS, Birmingham, Alabama**

BEFORE going into the actual discussion of slag for macadam work, I wish to take you along through the various stages of slag production and its content, in order that you may be impressed with the unusual value of slag in road construction.

There is produced annually, in the United States, over ten million tons of blast furnace slag, which, up to about ten years ago, had been considered a worthless or waste product.

Attempts have been made to use this slag in various ways, such as casting the molten material in moulds to form bricks or slabs for street pavement, in crushing and screening the slag after cooling, to prepare ballast for railroads, in using the properly sized material for the building of macadam roads, and when granulated, as a base for the manufacture of cements.

These attempts have met with unqualified success, but they consume only about 60 per cent of the slag produced, leaving large quantities available for other uses, as substitutes for stone and kindred materials.

The earliest writers of the history of the countries along the Mediterranean told of aqueducts, arches and other structures, ruins of which have successfully withstood centuries of time, which were made of cement concrete. This cement was called "Puzzolan," and was made of pulverized lava from the volcanoes.

Lava and slag are similar materials, both being the scoriae materials blown out of the molten interior of huge furnaces and cooled slowly in the air.

Sulphur Does No Harm.

The probable effect of the sulphur contained in slag when the latter is used in any of its forms in concrete-steel construction, is answered in the "Notes from Report No. IX" of Insurance Engineering Experiment Station, Boston, Mass.:

"The results of the test which were carried out under various conditions, lead to the conclusion that structural steel if encased in a sound sheet of good concrete, is safe from corrosion for a very long period; longer than the elements in our cities will allow any building to remain. It is a necessity, however, to be sure that the steel is properly encased in the concrete, and because of the difficulty of getting sound work, many engineers will not use concrete. This is especially true of cinder concrete in which the porous nature of the cinder has led to much dry concrete and many voids and much corrosion. There can be no question that cinder concrete has rusted great quantities of steel, not because of its sulphur content, the danger from which is a myth, but because it was too dry. If cinder concrete is mixed wet, and well mixed, it may be trusted as much as stone, so far as the corrosion is concerned."

I hold that the same is true of slag concrete. Oxidation of the sulphur in the slag and consequent corrosion of the steel from that cause cannot take place if the concrete is sufficiently solid to exclude the air.

The converse of this proposition is true, that no matter what materials enter into the concrete, if it is not made sufficiently solid to practically exclude the air, corrosion of the steel will inevitably result.

It is a well-known fact that iron will not rust in a basic medium, and as Portland cement as well as slag is essentially basic at ordinary temperatures, no fear need be entertained as to any corrosion of steel due to any water or sulphides that the slag or cement is likely

to contain, providing there is a continuous coating of cement mortar in contact with the steel.

I have commented on the use of slag in reinforced concrete work, because of the many concrete bridges now being constructed along the highways. In this, Jefferson county, practically all the highway bridges are built of slag concrete reinforced with steel, and I will state, without fear of successful contradiction, that such construction is very much stronger than any other kind of concrete.

Chemical Content.

Many of my hearers, no doubt, are conversant with the various kinds of slag. However, as there may be many who are not, I will preface my remarks by a brief description of slags, and especially those most suitable for road construction.

Slags are the fused compounds of silica, lime, alumina, magnesia, and other bases, and result as a molten by-product in the reduction of metallic ores. Slags



MR. SOLON JACOBS
President Birmingham Slag Company

from the different processes of reduction vary widely in chemical composition.

In modern manufacture slags from similar plants are chemically uniform, being carefully analyzed and kept so from necessity. But slags, even though the same chemically in the molten state, are changed to vary widely in physical characteristics by the treatment received during the cooling process. This treatment is of the utmost importance, since on it depends the fitness and value of slag as a structural and building material.

Southern Slag Best Quality.

Fortunately for this section of the country, there is no congestion and, consequently, no lack of dumping ground, as is the case in the Northern and Eastern iron manufacturing centers, where it is necessary to reduce slag to a granulated mass in order that it can be promptly loaded in cars and disposed of. Our slags are carried in molten state to high banks, dumped therefrom, causing the same to run in thin layers, and

by such action the slag is slowly air cooled. Such cooling gives a tougher product, and one less filled with air cells, as is often found in slags improperly treated.

Nearly all, if not all, of the slag produced in the south, by reason of the disposal above mentioned, gives us hard, tough, compact and impervious slag product.

The reason that slag produced from iron furnaces must, from necessity, be more or less uniform in chemical composition, is due to the fact that the furnace operators strive to produce primarily high grade foundry iron, and the character of such iron can always be determined by the character of slag produced; hence a more or less uniform slag product is always sought, and the furnace companies analyze all slag in order to

covering a period of a number of years, during which time I have been intimately associated in the slag business, I have failed to find any road metal that even approximates the value of slag for such purpose.

I know, and most confidently predict, that it will be only a matter of a few years when slag will be used in road construction to the exclusion of all other materials, where freight rates may not be prohibitive, and thereby run the cost of slag too high.

Where freight rates will admit it is not only the best material to use, by reason of its cementing quality, but on account of it being considerably lighter than stone or gravel. It can be handled by teams much more economically, and to convince you of the truth of this statement, I wish to submit the following figures which have been ascertained only after a careful investigation:

Saving in Transportation.

A two-horse team will haul on a poor earth road 8-10 cubic yard of stone or gravel, whereas it can haul 1 cubic yard of slag, or an increase of 25 per cent of slag over gravel or stone.

On a good earth road the same team can transport 1.06 cubic yards of stone or gravel, or 2 cubic yards of slag, showing an increase of 25 per cent in favor of slag.

On a good macadam road the same team can haul 2.04 cubic yard of stone or gravel, or 3 cubic yards of slag, a gain of 25 per cent in each instance.

From the above table it is readily seen that the use of slag means a saving of 25 per cent in wagon transportation alone, and the same proportionate saving applies to rail shipments.

When purchasing slag the buyer does not purchase a lot of moisture, dirt and other foreign substances which add greatly to the weight, and consequent cost of road metals. Slag is almost an impervious metal and will absorb less moisture than rock or chert. It is clean and contains no loam.

Since slag makes a much stronger concrete than gravel or limestone (as is indicated by a two-year test made by the Carnegie Steel Company, showing a strength of 729 pounds per square inch greater than gravel and 656 pounds per square inch greater than limestone,) why then should the same product not show better results in road construction?

Slag a Natural Cement.

It not only possesses every virtue that the other road metals do, but vastly more, in that it possesses natural cementing qualities that bind the particles together, which is so greatly desired.

Stone and gravel make a very good road base, but these materials in no wise compare in value for the same purpose with blast furnace slag.

In the construction of highways with metals other than slag, it is always necessary to put on top of the road, some kind of a binder, whereas, in the use of slag



Loading Slag With a Steam Shovel at the Slag Banks of the Birmingham Slag Company

keep the same uniformity, as much so as they do the iron. Consequently the variation in the chemical content is small. An average taken from a large number of slag analyses show the following:

Silica	35.90
Lime	43.40
Alumina	13.38
Magnesia	3.84
Sulphur	1.19

If you will carefully consider the contents of slag as shown by this analysis, it will occur to you, and especially to those who have any knowledge of the manufacture of cement, that this product is, in itself, a natural cement. In fact, the very highest kinds of hydraulic cement are made from slag, the analysis of which is quite similar to that I have just given, except there is merely added from 12 to 17 per cent of lime, which is done in order to give the cement a quicker set.

What is most desired in road metals, is something that possesses a natural binder, and in my experience



Panoramic View of the Plant of the Birmingham Slag Company, Birmingham, Alabama

this is unnecessary and consequently a great expense can be saved in this respect.

To correctly construct a highway, proper excavation should first be made and the sub-base thoroughly well rolled with a roller of at least ten tons in weight. This should be done no matter what kind of base material is used. However, in the construction of a slag road, in order to obtain the very best results—and I would recommend no other method—it is necessary that the loose slag be spread on the sub-base to a proper depth, and then thoroughly rolled from time to time as the work progresses.

Use Plenty of Water.

During such procedure it is recommended that the road be kept well wet with water, if water is available, and in finishing it is only necessary to put on top of the slag base about two inches of slag screenings, which contain dust and slag particles as large as one-fourth of an inch, which, like all cement, is inert in the dry state.

This likewise should be thoroughly wet and well rolled. In fact, the top should never be put on except with plenty of water and thoroughly rolled. This is necessary because of the natural cementing qualities of slag, and in order to get it properly bound this material must be rolled to eliminate as many voids as possible.

A slag road built under these specifications, instead of deteriorating, as is too often the case with most other road metals, will gradually improve until the entire road-bed becomes a solid mass, thereby giving practically a concrete road.

Spare Roller and Spoil Road.

It is sad, indeed, to watch road forces at work, not only along country highways, but more especially in the cities, where there are macadamized roads, for the waste of time and material is something appalling.

In our city here, where we have all kinds of road machinery, and especially heavy rollers, that are always available, streets are repaired merely by throwing loose slag or some other material into the ruts, and instead of finishing the job by rolling and compacting the material, making it more or less permanent, the loose material is allowed to remain, and vehicles passing over it, instead of compacting the filling, will cause the particles to grind into dust, which will be carried off, either by the wind or by rapidly moving automobiles, leaving the street in as bad condition as before it was repaired.

Therefore, I cannot too strongly urge upon all road builders the absolute necessity of in nowise sparing the roller, no matter what character of construction the road may be, and any official or officials who undertake the building of roads without proper rolling are wasting the people's money and will sooner or later be held accountable for such extravagance.

Slag is the one material that not only is cheaper, as a rule, than all other road bases, but it is available in large quantities and at all times, regardless of the weather. The rainy season has no effect on the shipment of slag, as is the case in the rock quarries and gravel pits, and by reason of the fact that it is usually loaded at points where a number of railroads center, cars are available when such is not the case at quarries and gravel pits located exclusively on one line.

Slag Better Than Stone.

There is being loaded out of the Birmingham district at the present time an average of 200 cars per day or approximately 9,000 tons of slag. A major portion of this

slag is being used by the railroads for the purpose of ballasting their road-beds.

Practically all of the railroads, especially those entering this section, have immense deposits of limestone and sandstone on their roads that are available for ballasting purposes, but on account of the availability and high character of slag as a ballast, they evidently prefer it to anything else.

This fact alone should convince the road builders of the great value of slag in highway work; hence my prediction that it will be only a few years before all road builders, where blast furnace slag is available, will use this material, even at an increased initial cost, and that it will take precedence over anything else.

Summary.

The advantages to be derived from the use of slag in building highways may be analyzed as follows:

It is a natural cement rock.

It will cement together if properly compressed by wetting and rolling.

It is, as a rule, vastly cheaper than any other road material.

It is available in large quantities, and at all times, regardless of weather conditions.

It is practically an impervious material.

It is considerably lighter in weight than stone or gravel, consequently a great saving in freight is effected, where distances are equal.

The Nashville (Ga.) Herald comments in a situation that not only confronts Berrien county, Georgia, but hundreds of counties all over the land. The Herald says:

Berrien is spending \$15,000 to \$20,000 a year on her public roads. That is all right, but we ought to spend



This Gravel Road in Lee County, North Carolina, Takes the Place of One of the Worst Roads in the County, Traces of Which May be Seen at the Left of the Picture

\$3,000 to \$5,000 a year on the upkeep of those same roads. Berrien is making a big mistake in spending so much for road building and then allowing the roads to go to ruin. They should be taken care of after they are built.

The South's Big Advantage

By D. T. PIERCE, Philadelphia

IN RESPECT to road improvement the South has at least one big advantage. It is in a position to profit by the experience, both engineering and financial, of the northern states which have up to this time taken the lead in road building along advanced lines. By advanced lines is meant the construction of paved roads as distinguished from dirt, gravel or plain macadam. The first lesson of the road building experience of the past half dozen years is that it pays to do the work well in the first place, to obtain the best engineering advice, to use the best materials, and always to avoid make-shift construction. The government's estimate that half the millions of money spent on roads in the past five years has been wasted is not an exaggeration. It has been wasted by spending too much on some roads; too little on others. It has been wasted by the purchase of road nostrums instead of standard remedies, by failure to construct properly in the first instance, and by failure to maintain roads when once built. It is to be earnestly hoped that the South will avoid these errors, the results of which are so strikingly evident in northern and western states.

In one of these states, where road building is supposed to have made great progress, there has been a lot of so-called comparative experimental work—usually bituminous macadam. This consists of laying

side by side when possible, a type of road known to be good and one that is claimed to be just as good and much less expensive. Let us see how this has invariably worked out. The really good road costs say \$6000 a mile and as a basis of comparison its life may be placed at ten years. This figures out a cost of \$600 per mile per year. The "cheap" road may cost only \$3000 a mile, but there is no precedent for supposing that it will last more than two years. This makes its cost \$1500 per mile per year—two and a half times as much as the good road cost. In many cases the so-called cheap road goes to pieces in less than two years and at no time during its life is it satisfactory to users. To call this economy is an absurd misuse of language.

Not only the lesson of these experiments but of construction on a large scale of cheap roads with poor drainage, poor stone, unskilled supervision, and poor binding materials, is that the most expensive "economy" ever devised is that which consists of saving a few dollars on original construction, only to see the entire investment wiped out by the wear and tear of a season's traffic. Those who insist that a roadway shall have the right kind of grading and foundation are always able to conserve this investment even if the road requires resurfacing from time to time. Resur-



Bad Piece of Road in Wake County, North Carolina. The Old Gentleman in the Picture Has Lived in the Vicinity of this Road All of His Life



Same Piece of Road in Wake County, North Carolina, After Improvement. The Grade is Much Better and the Road Has Fine Top-Soil Surface. The Old Gentleman in the Picture Probably Realizes by This Time What He Has Been Missing For Two Generations

facing is relatively inexpensive. Reconstruction is very costly.

Aside from faulty construction by untried methods, unskilled labor and supervision, and with unsuitable materials, it is probable that the greatest item of road waste should be placed on the wrong side of the ledger under the head of Failure to Maintain. Heavy traffic roads, the very best of them, require maintenance just as a bill collector's shoes require re-soling. No road or pavement will last indefinitely, nor will anywhere near maximum service be obtained from a road unless the effects of wear are attended to immediately, as they occur. A stitch in time saves nine—in roads as well as in clothes. To provide, therefore, only for original construction of expensive types of roads and not to make any provision for their repair is the most wasteful policy imaginable. New York spent the larger part of its first \$50,000,000 of road-bond money before it began to make systematic provision for maintenance. The result is that much of its new mileage must be rebuilt and maintenance, due largely to prior neglect is running as high as \$1000 per mile per year. On the 800 miles of improved roads built and projected in New York this rate of maintenance outlay would amount to an annual tax of \$8,000,000 a year—a staggering figure to add to current expenditure for new construction and the carrying charges on the investment already made.

Too often anyone who raises a voice in favor of sound road economics is howled down as an enemy to good roads. On the contrary, the advocates of good road work and sound road policy are the real friends of the movement. Find out what form of construction will cost least per year of its life; demand that the work be properly done; make adequate provision for maintenance; pay as you go when possible, and in any case avoid the issuance of long-term bonds to pay for

short-lived roads. All these are obviously good rules for good road builders. But the fact that they are so often unobserved is reason enough for repeating them.

Champ Clark on the Nation's Greatest Extravagance.

These are the sentiments of Champ Clark, for many years leader of the democratic minority in the House of Representatives and now speaker of that body:

The bad roads of America constitute the most stupendous wastefulness of the most wasteful people on the globe. They are the highest priced of all our many high-priced extravagances, the most nonsensical, the most unjustifiable.

Out of most extravagances folks get some sort of satisfaction. In most cases of extravagance we illustrate Poor Richard's doctrine about "paying too much for the whistle." Nevertheless, while the money wasted in extravagances of dress, travel, etc., is wasted by the individual, it is not lost to the world, as it goes to artisans and laborers, but the waste of bad roads is lost forever.

I saw it stated once that the energy, material, animal life and time wasted in this country by reason of bad roads amount to the enormous sum of \$400,000,000 annually. This is astounding and may be exaggeration, but it is known that the waste is enormous.

This state of affairs is so easily altered that it is idiotic, if not criminal, to let it continue, I am delighted that the people are waking up on this subject. Good roads will make money for farmers, merchants and incidentally for everybody. It will make life on the farm enjoyable. It will put up the price of farm lands.

We ought to learn something from the Romans. Their empire is gone, their language is dead, but their roads still endure. They understood the value of good roads and they built them.

Good Roads at Joint Convention of Texas County Officials Association

By R. O. McCORMACK, Fort Worth, Texas

The great Fort Worth joint meeting of the various county officials associations of Texas, the first gathering of the kind ever held in Texas, has passed into history and the effects on the good road movement in this state cannot fail to be far-reaching.

The associations that met at Fort Worth Aug. 7-8-9 were the county judges and commissioners, county and district clerks, county and district attorneys, county tax collectors and county treasurers. All of the first named, for they have the charge of the building of county roads in this state, and many of the members of the other organizations, were intensely interested in the road work being done in Tarrant county and the praise bestowed on the completed parts of the 132 miles of permanent roadway being built in this county was lavish. It is true they saw examples of the best, oil and asphaltum bound macadam, but the water bound macadam has also an asphaltic oil finish that, it is claimed, will give a good wearing road, where the traffic is less heavy than on the more costly oil and asphaltum road. J. C. Travilla, the engineer in charge

not less than 60 per cent of the $2\frac{1}{2}$ inch size. After thorough harrowing and rolling, the surface course of broken stone, of from $1\frac{1}{2}$ to $\frac{1}{2}$ inch in size, is spread so all surface voids in the macadam course are filled. That is watered and rolled until the stone ceases to wave in front of the roller, or be displaced by the wheels of a heavily loaded wagon. On the dry surface of the road tar is applied by means of a pressure wagon at a temperature of 200 to 250 degrees. After the tar has set for 24 hours clean fine stone, $\frac{1}{4}$ to $\frac{1}{2}$ inch in size, free from stone dust, is spread, evenly, so that all voids shall be filled, and the surplus stone removed by sweepings. The finish is with asphaltic cement, applied with a pressure wagon, at temperature of not less than 325 and not more than 375 degrees. That asphalt is covered with the clean stone, $\frac{1}{2}$ to $\frac{1}{4}$ inch, the final finish being with small stone and dust or stone screenings, not over $\frac{1}{4}$ in size and stone dust, spread or drifted over the surface with shovels to take up any excess of asphalt and then rolled until the surface is hard and smooth.

Class "B" roads are similar to the above, except the macadam course is thoroughly watered and rolled "until a grout has been formed by the stone dust and water that shall fill all of the voids and form a wave before the wheels of the roller, the rolling being continued until the engineer is satisfied with the results. The road is then dried and opened to traffic for one week, or longer, if the judgment of the engineer dictates. A cushion coat of stone dust is spread over the surface of the rolled stone and that is to be renewed as often as may be required by the engineer. After the road has been in use for the time dictated by the engineer, the surface is swept with mechanical sweeper or fiber brooms until all of the dust is removed and the surface of the macadam exposed. That is water sprinkled and hot asphaltic oil—250 to 350 degrees—applied with pressure wagon, the oil to be applied with air temperature of not less than 50 degrees. The surface is finished with an inch of small clean stone rolled until a hard smooth surface is had.

Every process of road construction was shown. Many miles of the new road system conform to the old county roads. Those were all well graded and with good foundations, generally surfaced with cement gravel. Those old surfaces were sacrificed, grades changed, where needed and lines straightened, cutting off corners, running tangents where there were curves, etc., as might be demanded and the new road built on the old, where it was expedient to do so, or built anew as might be best to secure the best result. But little of the new roads will have as much as a 5 per cent. grade, the reduction of grade as well as straightening of the roads being considered as of prime importance.

Radiating from Fort Worth the principal, or cardinal roads run in the general direction of the cardinal points of the compass. The sub-cardinal roads are generally on the 45 degree angles between. Provision is also made for neighborhood or cross country roads connecting the main roads.

Taking advantage of the exceptionally low railroad rates offered a meeting of the Meridian Road association of Texas was held in Fort Worth at the same time



Convict road force installing a section metal culvert, 6 feet in diameter and 74 feet long in Gaston County, North Carolina. The embankment at this point is 20 feet high

of the Tarrant county road work, the designer of the roads, gave illustrated explanatory lectures on the whole system of competent road building and if there were any doubting Thomases who came to Fort Worth for these meetings, doubtful of the value of good road building at the necessary cost, they went away converts. Many came, already convinced, merely to learn from what Tarrant county was doing with its million dollar road improvement bond issue, that they might in the work in their own counties, in present prospective work, avoid the errors of, perhaps, costly experiments. It may not be amiss to repeat the specifications under which the contractors are building the Tarrant county roads.

Class "A" roads are asphalt macadam. After the preparation of a solid foundation a course of hard crushed stone is spread, uniformly, so that after being well harrowed and compacted with a roller—self-driven—weighing not less than ten tons, the stone base shall be not less than four inches thick. The stone must be of sizes that will pass through a $3\frac{1}{4}$ inch ring and be retained by a $1\frac{1}{2}$ inch ring, internal diameter, with

of the meeting of the county officials conventions. At that the selection of the route, finally, through the state was made. Crossing from Oklahoma into Texas, at Burkburnett on the Red river, the line runs south through Wichita Falls, Henrietta, Bowie, Decatur, Fort Worth, Cleburne, Hillsboro, Waco, Bryan to Houston and Galveston.

At Waco a line diverges that runs through Austin to San Antonio and on to Laredo. At San Antonio one line runs to Corpus Christi, through Beeville and another to Galveston by way of Seguin, Gonzales Bay City and then along the coast.

D. E. Colp of San Antonio was elected president and W. H. Beck, of Fort Worth, assistant secretary of the Fort Worth Chamber of Commerce, was elected secretary-treasurer. C. L. Williams of Bowie, president of the Colorado-Gulf Highway association, was elected vice president of the first, or North Texas division, there being seven divisions in Texas.

The other vice presidents are to be named after consultation with local members of the association one for each division. They with the officers elected, will constitute the executive of the association.

An assessment of \$100 per county was levied. Meetings are to be called by the executive committee. This committee was also directed to prepare a constitution and by laws to be submitted for adoption.

The Fort Worth Chamber of Commerce gave the delegates, about 75 in number, a luncheon at the Terminal hotel. Among the speeches was one by Judge T. J. McMurray of Decatur in which he prophesized that within ten years, there would be such a large use of heavy load motor trucks that the roads and bridges

now in use would all have to be strengthened and that much expeditious short haul delivery of freight would be made by this means. Therefore he advised that all new road and bridge construction be planned with this future in view.

The Fort Worth Branch of the Southern National Highway association was organized in Fort Worth the evening of Aug. 11, following addresses by Col. Dell Potter of Clifton, Ariz., and others. W. G. Turner of Fort Worth was elected president and W. H. Beck secretary-treasurer. The meeting was held in the Chamber of Commerce rooms and was well attended.

Southern Appalachian Good Roads Convention October 22-23.

The fifth annual convention of the Southern Appalachian Good Roads Association will be held in Asheville October 22 and 23rd. Last year the association met in Atlanta, Ga.

The sessions of the convention will be held at the Langren hotel. The Asheville Board of Trade, which worked hard to land the convention, will have charge of arrangements for entertaining the good roads delegates and a great time is promised. Asheville and the whole mountain region are at their best in October.

Dr. Joseph Hyde Pratt, of Chapel Hill, N. C., is president of the association and Mr. H. B. Varner, of Lexington, N. C., is secretary. Announcement as to program, speakers, hotel arrangements, etc., will be made in the October issue of Southern Good Roads.

Cartersville, Georgia has issued bonds for \$15,000 for street improvement.



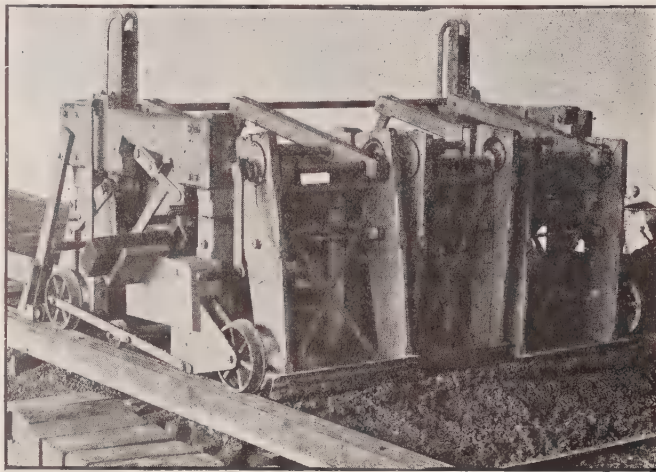
On the Central Highway, in Buncombe County, North Carolina

The Bayley Street Paving Machine

By DR. JOSEPH HYDE PRATT

RECENTLY the writer had the privilege of examining a working model of a machine that will pave a street with brick, asphalt blocks or any form of block pavement more evenly, pressed closer together, more quickly and much cheaper than can be done by present methods, where the blocks are laid by hand. The same machine also prepares the road bed, smoothing and bringing to grade the cement mixture of grout, sand or other material upon which the blocks are laid. Figures 1 and 2 illustrate this machine, and this is the one that did the actual paving that is described below.

This machine was invented by Mr. William Bayley, Mechanical Engineer, Springfield, Ohio, and the writer



William Bayley Street Paving Machine, Front View

saw the method of operation of the machine, and the work it did in the shop of the William Bayley Company.

The experimental paving that was laid by this machine was 114 ft.x25 ft. 8½ inches, or 325.6 square yards, and was laid down in four rows, each 6 ft. 1 inch wide, this being the width of the machine. A space of 5½ inches was left between the rows, which was occupied by the rail (upon which the machine was run), while the row next to it was being laid.

The machine can be made to lay any width of street, and the curbing can be used as one rail upon which to run it or, if the street is not too wide the two curbing can act as the rails upon which to run the machine.

Asphalt blocks, having a surface of 5 in.x12 in., 3 inches thick and weighing 16 pounds each, were used in paving the floor referred to above. The blocks varied as much as ¼ inch in all these dimensions. These were laid upon a prepared cement base, which consisted of a mixture of fine gravel and Portland cement in the proportion of 8 parts of gravel to one part cement. This was mixed by hand, and was a wet mixture just stiff enough to stand without flowing. This was dumped in front of the machine, and was spread and smoothed by the shovels and rammers and brought to the proper grade ready to receive the blocks, which were laid upon it. The action of the shovels was extremely satisfactory in that they rolled the mixture ahead of them thus more thoroughly mixing it, and made a smooth even surface, upon which to lay the blocks. The blocks feed by hand to this machine, but in a large ma-

chine they would be fed automatically, and thus would increase the speed of the machine. With engine attached and the automatic feed, the whole operation of preparing the surface for the blocks, feeding the blocks to the machine, laying them on the cement or other surface, rolling and pressing them down, would all be done automatically.

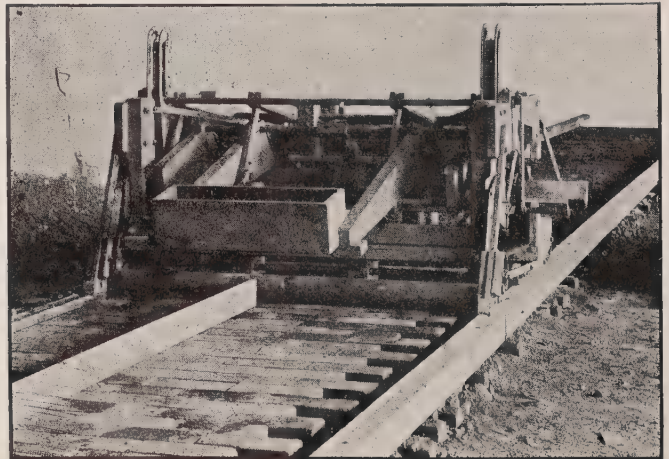
In the present experiment the roller was set to press the blocks 1-8 in. into the surface prepared by the rammers, but this was gradually lowered until when the fourth row of blocks was laid, it pressed the blocks down 1-4 in., and this was found to make the work about perfect.

The cement does not settle after the machine has finished its work, for it has been tested by running the roller over the work that was done the day before, and the roller was in constant contact with the blocks.

The machine pressed the blocks very closely together, so much so that it was impossible for a workman to fill in between two rows of pavement and keep his work as close, even when he picked out the narrowest blocks that he could find.

As the blocks are placed the machine is pushed forward by the block placer, and the shovels are raised, and when the block placer is being returned to be filled, then the shovels are lowered this all being done with one movement.

It will be interesting to give a comparison between a handlaid pavement and the one laid by this machine. In comparing the results no charge is made for putting the cement grout in front of the machine, as this has



William Bayley Street Paving Machine, Rear View, Showing Completed Pavement

to be dumped on the road when the blocks are to be laid by hand; nor is there any charge made for the cost of laying the track upon which the machine runs, for it is believed that this offsets the cost of labor that is consumed in applying this cement grout, ramming it, and bringing it to the proper grade for the blocks, when the blocks are laid by hand.

The cost to run the machine, using two men: one to feed in the blocks and the other to work the shovels and the rammers, per square yard, was \$.0367. The speed of the machine was 135 yards in 9 hours.

For comparison, the work of the Toledo Asphalt Block Paving Co., one of the most prominent contrac-

tors in Ohio, in laying an asphalt block pavement on Fountain Avenue in Springfield, Ohio, is used:

One of the best day's work done by this company on this street showed the cost per square yard, \$.078. The speed at which the men laid the blocks was 675 square yards in 9 hours for a gang of 26 men. The crew laid five times as much pavement, but required thirteen times as many men. If the two men had worked the machine thirteen days, and thus put in 26 days' work, they would have paved 1755 square yards. Then again, one of these machines with an engine attached would require only one man to run and feed it, and would cut the cost of laying one square yard to \$.01835.

A larger machine could be fed from both sides, using four men, and this would increase the speed to 540 yards in 9 hours. This beats hand work without speeding up the machine, and with an automatic feed, the speed of the machine could easily be doubled.

Asphalt blocks are laid directly on a cement base, but some engineers object to laying vitrified brick directly on cement and prefer to lay them on sand. This machine prepares the sand surface equally as well as the cement. The shovels can be lowered $\frac{1}{2}$ inch, 1 inch, or $1\frac{1}{2}$ inches as required and the cement grout rammed and surfaced. After about six or any desired time, the machine can be backed up and the shovels set to normal position. The sand is then put on and the machine levels, smooths and prepares it for the brick, with this advantage over hand work, that the sand will be of an uniform thickness.

The machine will lay the blocks with any curvature to road surface that is desired.

This machine will also lay cement sidewalks better and cheaper than can be done by present methods. In laying sidewalks the shovels are lowered $\frac{1}{2}$ inch to $1\frac{1}{2}$ inch as may be required and the rough cement grout is

rammed in and surfaced. The machine is then backed up, the shovels raised, and the top crust put on, which is smoothed and finished by the machine. The only hand work necessary was to cut the joints. The work of the shovels on the cement surface was very satisfactory and the speed of the machine was fast, it being advanced at the rate of 2 inches per minute in laying the cement grout and 3 inches per minute in laying the top coat.

It would seem from the above that this machine offers very great possibilities for reducing the cost of laying block pavements, and at the same time making a better job; and also of reducing the cost of cement sidewalks.

Coming Good Roads Conventions.

Southern Appalachian Good Roads Association, Asheville, N. C., October 22-23.

North Carolina Good Roads Association, Raleigh, N. C., September 24th.

U. S. Good Roads Association, St. Louis, Mo., November 5th.

American Road Congress, Detroit, Michigan, Sept. 29th-Oct. 4th.

National Paving Brick Manufacturers' Association, Cleveland, Ohio, Sept. 17-18.

Duval county, Florida, of which Jacksonville is the county seat, will begin the building of brick roads. This county has a bond issue of \$1,000,000 available for the work.

The city of Charlotte, North Carolina, will spend \$60,000 in sheet asphalt and concrete paving.



Beautiful piece of Chert gravel road near Fort Smith, Ark. It was built in 1903 and has stood up well under traffic

Co-Operative Road Building in Western North Carolina

By N. BUCKNER

Secretary of Asheville Board of Trade

CO-OPERATIVE road building is firmly established in the mountains of Western North Carolina. A thousand men along the road from Hendersonville to Bat Cave in the famous Chimney Rock section, 20 miles from Asheville, gathered together for work two days on the main road to fill up the holes, clean out the ditches, put in under drains, smooth the bumps and in many places reduce the grades. The idea was conceived and interest aroused through the efforts of Col. John T. Patrick, former immigration agent of the

was impassable to automobiles before the co-operative working, but since that the road is in good condition for automobiles and a large number have been making the trip through this wonderful scenic region. From Bat Cave to Chimney Rock is on the line of the Asheville-Charlotte highway, and the road from Hendersonville to Bat Cave is the connecting link from the Asheville-Greenville highway which connects with the New York-Atlanta highway. The road from Hendersonville to Bat Cave is a popular drive for the visiting autoists in Asheville and other points in the Land of the Sky, the road between Asheville and Hendersonville being in excellent condition. A squad of seventeen convicts from the state penitentiary has just arrived to go to work on the Hickory Nut Gap Mountain road from Bat Cave west through the Gap to Asheville connecting with the good road from the Buncombe county line into the city. This stretch of six miles will require a year, perhaps to complete, most of the road bed having to be blasted from granite. The balance of fifty convicts will probably be put to work



Squad No. 3 of the Volunteer Road Workers in Henderson County, North Carolina, Replacing a Bad Mud Hole With a 14-Inch Underdrain

Seaboard Air Line Railroad, and the work was done on Thursday and Friday, August 14th and 15th. On the Saturday following, a great barbecue was served to all the road workers and those who contributed money or in any other way helped along the cause of co-operative road building. People from the countryside for miles around came and brought their families and friends. Two big steers were barbecued, and these with the cakes, pies and pickles and other good things prepared by the good wives of the farmers made firm friends of visitors and neighbors, and all of good roads and co-operative road building. This occasion was the second event of its kind, the first having been pulled off on the road between Bat Cave and Chimney Rock, this road following the Rocky Broad River through the wonderful canyon, a great rocky gorge in between two great mountains several thousand feet high, and culminating at the extreme eastern end with Chimney Rock, a great granite shaft rising up from the side of the mountain to a height of three hundred and twenty-five feet, its top more than forty feet across, and about seventy-five feet from the mountain side.

The road worked from Bat Cave to Chimney Rock is ten miles in length; the road from Hendersonville to Bat Cave fourteen miles in length. The former road



Showing the Big Table at the Barbecue Dinner Spread For the Volunteer Road Workers in Henderson County, North Carolina, Last Month

on this road within the next thirty days. Five thousand dollars in public subscriptions have been raised by the people along the line of this road and others interested (\$2000 raised in Asheville) to employ free labor, and to furnish teams, dynamite, etc., in order to hurry completion of this line of road which will complete the Asheville-Charlotte Highway giving a good road from Charlotte to Asheville through a scenic territory possibly unequalled for rugged beauty and grandeur in America. That the road fever is at a boiling point in the Land of the Sky is evidenced by the fact that less than a dozen counties in this section have voted a million and a half dollars within less than twelve months for road building purposes.



Co-Operative Road-Building in Henderson County. All Classes and Conditions at Work on the Hendersonville-Bat Cave Road.
Mr. N. Buckner is Standing Beside the Old Gentleman With a Hoe

An Annual Training School for Road Officials.

A movement is on foot, says the Washington (D. C.) Star, to make the American Road Congress an annual training school for road and street officials whereby they may increase their efficiency through attendance at lectures given by leading specialists, and by study of the government and commercial exhibits of materials and equipment. This year's session of the congress which will be held at Detroit during the week of September 29th, will bring together the greatest authorities in the land on every line of road and street work, and will be supplemented by the most remarkable and instructive series of exhibits ever shown in this country.

It is contended that a great deal of money can be saved to states, counties, and municipalities by having the road and street officials attend the American Road Congress at the expense of the state and local governments. The reason of this is that the officials can there see and critically examine and compare every known labor-saving device and equipment for road and street work; critically examine every known road material in competition with all known road materials; study the government exhibits, which illustrate the exact

methods of constructing every recognized type of road; obtain without cost practically a library of national, state and commercial publications which will be available for distribution by the various exhibitors; hear addresses and discussion by men whose advice, if rated at its commercial value, would cost hundreds of dollars; become personally acquainted with the men who are actually directing the building, maintenance, and administration of streets and highways and obtain the benefit of personal discussion with them. The supporters of this plan of official representation call attention to the fact that in many cases private corporations, and even states and cities, send representatives to various points in this and other countries to study a single device, method or material, and that nowhere could a greater amount of knowledge concerning the construction and maintenance of roads and streets be acquired in so short a space of time as at the Road Congress.

De Soto county, Florida, will vote soon on a bond issue of \$500,000 for the building of a system of highways. Vitrified brick roads are favored and it is estimated that this sum will build 200 miles.



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Official Organ of the South Carolina Good Roads Association

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FOR A STATE HIGHWAY COMMISSION IN NORTH CAROLINA.

The North Carolina Good Roads Association which held its regular annual meeting at Morehead City last month, will hold an adjourned meeting in Raleigh on Wednesday, September 24th. The North Carolina legislature meets the same day in special session.

Among other things the association will take up the the state highway commission question and endeavor to interest the legislators who will be assembled there in the matter. North Carolina needs a state highway commission and needs it very badly. Many thousands of dollars are being wasted in the state every year because of the lack of a central, well organized road-building organization, equipped to give engineering assistance to the various counties of the state and direct the expenditure of road funds.

The meeting should be largely attended. All of the delegates who attended the Morehead City meeting are expected to attend and a cordial invitation is extended to all good roads advocates throughout the state to take part in the meeting.

GOOD WORK IN ALABAMA.

The second annual report of the Alabama State Highway commission was issued in August. It is a very interesting document and tells a story of progress and

development along good roads lines that is encouraging indeed.

According to the report, nearly \$250,000 was spent under the supervision of the commission during the year ending March 1. Of this about \$220,000 was for roads and the remainder for bridges.

Fifty-six counties applied for state aid in 1912 and 46 received state aid during that year. In 1913, up to March 1, thirty-one counties had made application for state aid in road and bridge building. If the record holds up for the entire year, practically every county in the state will have received aid from the state.

Alabama is going forward. We doubt if any southern state is making a better showing all along the line and to the state's very efficient highway department is due the major part of the credit for the progress being made. Like most southern states, Alabama goes slow in the matter of appropriating moneys out of the state treasury for any sort of internal improvements, and the fund at the disposal of the commission is small. It has been used wisely, however, and that is the reason so much good has been accomplished.

Alabama is fortunate in that it has one of the best state highway engineers in the country, Mr. W. S. Keller. He was won wide recognition and is in demand everywhere to address good roads conventions and take part in good roads conferences. His assistant, Mr. R. P. Boyd, is also a road engineer of high attainments. The State Highway Commission is composed of strong men, who bring to the rather thankless task of directing the road work of a state, ability of a very high order. The commission is composed of the following:

Robert E. Spragins, Chairman, Huntsville, Ala.; Prof. G. N. Mitcham, department of Engineering, University of Alabama, Auburn; Dr. Eugene A. Smith, State Geologist, University; V. B. Atkins, Selma; John Craft, Mobile.

THE RAILROADS ALWAYS READY TO HELP.

The railroads are doing fine work for the good roads cause in all parts of the United States and Southern Good Roads takes pleasure in passing on the following tribute to the railroads of Missouri from the St. Louis Republic:

"This is not a time of great cheer in railroad circles. The roads of Missouri find revenues stationary or declining, while expenses steadily mount upward. Wages are rising; taxes grow heavier; materials continually become expensive; railroad legislation increases railroad expenses. Railway tariffs remain stationary or go downward. And the elements seem to have conspired also. Missouri has seen flood followed by drouth in a single year.

"But though cast down, the railroads are not destroyed. In fact, it takes more than receivership for some lines and straitened incomes for others to keep Missouri's railroads from a share in Missouri's good road movement. When the governor of Kansas gives a hitch to his overalls next week and remarks to the governor of Missouri that it's a long time between seasons of refreshment, the railroads of Missouri will have made their contribution to the work going on in scores

of counties of the state. Rates merely nominal, which fail to cover the actual expense of train movement, upon the transport of river gravel and broken stone, will represent the railroads' gift to the good roads festival and prove their response to the enthusiasm which is sweeping the state from Atchison to Pemicot and from Clark to McDonald."

Five of the big railroads of Missouri took an active part in Missouri's "Good Roads Days," transporting machinery and road-building material at merely nominal rates and making cash contributions in scores of communities. One or two of the roads of that state have made special rates for the carrying of machinery and material consigned to county or state road officials, not just for a season but for all time.

It is the same all over the south. Everywhere the railroads are helping the good roads cause. Within the past two years good roads trains have been run over to Southern, the Atlantic Coast Line, the Norfolk & Western, the Frisco lines and other great railway systems of the south, educating hundreds of thousands of people to the need of better roads and the best ways of getting them.

Most of these trains have been known as "government good roads trains" but they have been made possible in every case by the liberality of the roads over which the trains were operated.

The railroads have done great things for the good roads cause and we are glad to see them receiving some recognition of their services. You may count on the railroads all the time, good times and bad times, in prosperity and in panic.

FOLLOWING SOUTHERN NATIONAL HIGHWAY.

Col. Benehan Cameron, of Stagville, N. C., general vice president of the Southern National Highway Association, writes Southern Good Roads that Pathfinder Westgard, who has been engaged to map out an All-Southern Transcontinental Highway, will follow the line of the Southern National Highway as adopted by the convention that met in Asheville a few months ago. At first it was planned for Mr. Westgard to go by way of Memphis, Nashville and Bristol, leaving the Southern National in Tennessee, but Col. D. M. Potter, Colonel Cameron and others, took the matter up with the American Automobile Association, whose field representative Mr. Westgard is, and the change was made.

It is understood that the A. A. A.'s great Reliability Run, formerly known as the "Glidden Tour," will be run over the route Mr. Westgard will follow. This will serve to focus national attention on the Southern National and will help the project along wonderfully.

Wasting Road Funds.

The Office of Public Roads of the Department of Agriculture is making a strong effort to focus the mind of the country on the fact that maintenance and effective repair are of equal importance with the actual improvement of bad roads. Investment of money in new roads does not become real economy until provision is made for keeping these new roads in condition after they are

built. If a new road is built and then allowed to fall into disrepair, much of the original investment is simply wasted.

Europe, generally speaking, is ahead of the United States in the matter of road improvement, but Great Britain is struggling with a problem similar to the one that confronts the people of the United States. In England, Scotland and Wales there are no fewer than 2,140 separate authorities who between them, administer 175,487 miles of roads, or an average of only 82 miles apiece. In Scotland, apart from the big cities there are over 200 burghs, one-half of which have but 10 miles of road apiece to maintain. Needless to say, such a minute mileage is insufficient to keep the road plant fully occupied all the year around, and renders the employment of a skilled engineer impossible for economical reasons.

Officials of the office of public roads when called upon for assistance by the various states are pointing out that road building is an art based on a science, and that trained men and experienced men are necessary to secure the best results from the expenditure of road funds.

Statisticians have found that although the average expenditure on the improvement of roads exceeds one million dollars a day, a large portion of the money in the United States is wasted because of the failure to build the right type of road to meet the local requirements or the failure to provide for the continued maintenance of the improvement.

The various states and counties within the past six months have taken a greater interest in road improvement than ever before in the history of the United States, and there is now a strong movement to conserve the roads of the country where they are improved. Scientific maintenance will be one of the chief features of the work of the office of public roads throughout the present year.

"The Wonderland of Trinidad" is the title of an elaborately illustrated booklet issued for free distribution by The Barber Asphalt Paving Company, Philadelphia. The text and pictures are confined to description of the island of Trinidad, its asphalt lake and the mining and handling of asphalt up to the refining stage. This is the first publication in any form that gives an adequate idea of the natural wonders of an asphalt lake, its formation and the physical conditions surrounding such deposits. The booklet is very interesting reading. Write for a copy to-day.

Of the things that bad roads do to folks Governor Dunne, of Illinois, recently enumerated the following:

"The loss to farmers, because of inaccessible primary markets and the abnormal expense of transportation due to bad roads, must be considered as a contributing cause of the high cost of living. In some Illinois counties highways are impassable to ordinary loads for a third part of the year. Bad roads not only hinder crop production and marketing but they keep the rural consumer away from the merchant for weeks at a time. They keep pupils from the schools and voters from political gatherings and from participation in elections. They impair the efficiency of churches, and social, fraternal and other organizations which depend largely on public gatherings for the efficacy of their work."

The commissioners of Grady county, Oklahoma, will build five bridges in two townships and are asking for bids.

Why Convicts Should be Worked on the Public Roads

By **H. B. VARNER**

President North Carolina Good Roads Association

I FIND that my name is on the program to make a speech on the subject, "Why Convicts Should Be Used on the Public Roads." I have been so busy with road campaigns and with my duties as Chairman of the Central Highway Trustees, that I have made no preparation whatever.

In the beginning, I want to say that I have no criticism for those who are profiting by the present system of the State giving away its convict labor, and I do not censure them for desiring to retain that advantage—that's human nature. Most any of us would object and use all influence possible before we would surrender such a "soft snap" as receiving \$358 per day in the way of convict labor from the state without giving anything of value in return. The gentlemen who are promoting these railroad projects in North Carolina are splendid fellows, it is true, but there are lots of good fellows in this state who are just as much entitled to this bonus from the State as they are.



H. B. VARNER

Some of the newspapers have been criticising my action along this line because I have been trying to do something for the good of the State with the State's convicts. At the present time, as you all know, I presume, North Carolina's convicts are being worked on the State's farm and on the numerous railroads of the State. Now, when I mention that they have been worked on the railroads, do not get the idea that they are being hired out to these railroads, that the railroads are taking care of them, or are paying the State anything for their services. That would be a mistake. They are being employed, not by real railroads, but by lumber railroads and roads promoted for personal gain by a favored few. The promoters of these projects get bills log-rolled through the Legislature providing that the State shall furnish convicts to these roads and the State board, keep, and take care of them in every way, and take in payment stock in such railroads. We have today in the treasury of the State something over \$400,000 in stock of this char-

acter. The State has paid for the maintenance of these convicts, which is something like 66 cents per day each. It has taken from the treasury the hard-earned tax money of the people to pay the expense of work done on these railroads, and has taken in payment stock that is absolutely worthless. A few days ago I saw the Chief Clerk of the Treasury Department in a meeting, and I asked him what was the value of this stock. He said it was absolutely worthless. I knew it was worthless, but I wanted to have it authoritatively. We are throwing away this convict labor; we are giving it away, not for the good of the people of a few counties, but to enrich promoters. We are giving away \$358 of convict labor each day, which amounts to \$104,700 every year. We could hire out every convict in the State to real railroads and get \$1.50 a day cash for their work. Now, if we are going to work the convicts on the railroads, we ought to hire them out to railroads that will pay us cash, and thereby wipe out the deficit in the State's Treasury.

Do these railroads deserve State aid? If they do, it is the duty of the General Assembly to openly and boldly make a direct appropriation of certain amounts to each of these schemes from the State Treasury. Let's be honest with the people and stop making these gifts in an indirect "hocus pocus" manner.

The men who are profiting by this policy cannot defend it, but beg the question by saying the State is morally bound to carry out these contracts because they are acts of the General Assembly. My answer is, that owing to the fact that the bills were slipped through without a full and free discussion, that the General Assembly is under moral obligation to the people to repeal these acts. There is no question in my mind but that the whole business is morally wrong and that the policy is unwise and dangerous and clearly unconstitutional.

Article 5, Section 4 of our Constitution, says:

"The General Assembly shall have no power to give or lend the credit of the State in aid of any person, association or corporation, except to aid in the completion of such railroads as may be unfinished at the time of the adoption of this Constitution, or in which the State has a direct pecuniary interest, unless the subject be submitted to a direct vote of the people of the State, and be approved by a majority of those who shall vote thereon."

As Chairman of the State Prison Board, I made a report to the Governor of the State, expressing these sentiments, and today I am being denounced by certain newspapers, who seem to be more interested in the welfare of the men who are securing this convict labor than they are in the welfare of the State. I want the people to understand this proposition, and when they do, I am sure they will instruct their members of the Legislature what to do. This policy of giving away our convict labor must be stopped, and will be stopped. The convicts ought not to be worked in competition with the farmers; they should be worked on the public roads and build wagon roads, and the coun-

*Informal address delivered at the Annual Meeting of the North Carolina Good Roads Association at Morehead City, July 31, 1913.

ties or road districts should pay the actual expenses of working these convicts, so that it would not be a drain upon the State Treasury. This would be encouraging road building and helping the counties to build up North Carolina and make it the good State it ought to be. This is my idea.

The State of Georgia is putting all of her convicts on the public roads and building market roads to the towns, and the result is that Georgia is going far ahead of all Southern States in road building and general development along all lines. Dr. Pratt and myself and a number of other good roads advocates spent some time with the General Assembly during January of this year, trying to advise the legislators about this convict proposition, but the legislators seemed to think that they knew more about the matter than we did, and refused to heed the request of this Association in regard to the State's convicts being put on the roads. It was due to the fact that so much lobbying was done and that the legislators did not understand the proposition by which the convicts are allowed to be put on these railroads. We ought to stop this method and begin building roads and do something for the good of the State. There were acts passed by the recent General Assembly calling for nearly 2,000 convicts to work on various railroads and other projects, to be paid for in worthless stock—"chips and whetstones"—absolutely throwing the convict labor away. We draw on the State Treasury and take out something like \$150 per day for maintenance and get in return absolutely nothing but worthless stock.

We ought to take some step at this convention in regard to this convict matter. At the last Good Roads Convention there was lobbying done in favor of continuing this policy. Men were there muddying the waters. I am not running for any office. If I were, I probably would not express myself in this way. Certain newspapers have given out the information that I was thinking of running for Congress. I am not a candidate for any office at present. I would rather help break up this infamous convict system than hold any office. This is the greatest office I have ever held, an office of service to the State, working without reward or the hope of reward, except the consciousness of knowing that I am doing my duty to the people of the State, aiding in my feeble way in the elevation and betterment of mankind.

What I want is to stop giving away this convict labor and put the convicts on the public roads. When this is done you will see North Carolina go forward in road building and general development along all lines, and she will stand in the forefront of all the States of the Union.

U. S. Good Roads Association at St. Louis Nov 10-15.

Hon. Thomas L. Cannon, managing director, United States Good Roads Association, was in Birmingham for several days last month consulting with Mr. J. A. Rountree, secretary of the association, who is working systematically to make the coming meeting the greatest of the kind ever held in the United States. Col. Cannon in talking of the coming convention, says:

"St. Louis is preparing to entertain the largest good roads convention in the history of this country.

"The third annual meeting of the United States Good Roads Association will be held in St. Louis at the old exposition grounds for six days beginning November 10. The Convention Exposition Company is now making elaborate arrangements to entertain

and take care of the convention which is expected to bring 25,000 people to the city.

"Senator John H. Bankhead, of Alabama, is president of the association and is taking a keen and active interest in the movement and especially in the coming convention. J. A. Rountree, of Birmingham, is secretary and Judge W. I. Grubb is treasurer, both of whom are doing splendid work in promoting the meeting.

"The Convention's Exposition Company will give the use of its halls free for the convention. It has exhibit halls for which a nominal charge will be made for exhibits during the six days of the convention. After the expenses of preparing for the exhibition is deducted, fifty per cent. of the remainder will be turned over to the good roads association for good roads campaign purposes.

"There are three large assembly halls with respective capacities of 5,000, 2,000 and 1,200 people. There are twenty committee rooms. In the exhibit grounds will be cafes and every other convenience for the visitors.

"Good roads associations of almost every state in the Union, as well as other good roads organizations everywhere, are interested in the convention and will send delegates. Governors of states will be asked to send delegates. Mayors of all the large cities and presidents of commercial organizations will be asked to name delegates and we are preparing for the greatest assemblage of good roads advocates in the history of this country."

United States Senator John H. Bankhead, president, and J. A. Rountree, secretary, of the United States Good Roads Association, have issued the official call for the meeting of the association in St. Louis on November 10th to the 15th, which is as follows:

"Pursuant to a resolution passed by the United States Good Roads Association in convention assembled in Birmingham, Ala., April 24th and 25th, I hereby call a congress of the United States Good Roads Association to meet in the city of St. Louis, Mo., beginning November 10 and ending November 15, 1913.

"The controlling purpose of the association is to secure federal aid in the construction of of an adequate system of highways throughout the United States. The association desires to extend its activity toward the passage of state laws in harmony with federal aid legislation. It does not hope to amalgamate all good roads organizations into one grand body, but most earnestly desires their co-operation in one great effort to accomplish the ends sought by all namely: appropriate legislation looking to the building and maintenance of highways throughout the United States, and to secure appropriations from the federal treasury to effectuate such legislation.

"The United States Good Roads Association earnestly invites the co-operation of all good roads organizations, national, state and county, to send delegates to the convention to be held under the auspices of the United States Good Roads Association, beginning November 10, up to and including the 15th. Please send list of delegates to the secretary of the association, Birmingham, Alabama."

The commissioners of Coosa county, Alabama, will build a bridge across Hatchett creek at a cost of \$5,000.

The commissioners of the District of Columbia are having plans prepared for a re-inforced concrete bridge across Rock Creek at Q Street. Estimated cost \$275,000.

Who's Who in Highwaydom

Honorable John Humphrey Small was born in the staid old town of Washington, Beaufort county, North Carolina, so many years ago that he evidently does not care to have the date go on record, as he fails to set it down in the Congressional Directory where are chronicled the life and achievements of Uncle Sam's 394 representatives and 96 senators.

He was educated in the schools of Washington and at Trinity College. He quit college to teach school a few years and studied law between times, emerging as a full-fledged attorney in 1881. He took a running jump into the middle of the game of politics and was elected reading clerk of the state senate that same



HON. JOHN H. SMALL

year. Further along in the same year, he acquired another quasi-political job, superintendent of public instruction, which he held with credit until something better came along. In 1882 he was elected solicitor of the county court of Beaufort and he held that job down as long as he wanted it, retiring in 1885.

Meanwhile he had found time to run a newspaper, keep a watchful eye on the schools of the town of Washington and Beaufort county, aid in the up-building of every community enterprise, build up a big law practice and direct the fortunes of the county democratic organization. He was one busy young man through all those years.

He quit editing in 1886, after having been at it three

years, because of the growth of his law practice. In 1888 the county commissioners of Beaufort, casting about for a safe counselor, made him their attorney and he held the job until 1896. The town of Washington also recognized his worth and called him to serve as alderman from 1887 to 1890 and for one year during that period he was mayor of the proud city of Washington. In 1888 he was chairman of the democratic executive committee of the First district and a year later he became chairman of the democratic executive committee of Beaufort county. He held that position until 1896. He was democratic presidential elector in the disastrous days of 1896. In 1898 the people of the First district elected him a member of the fifty-sixth congress and they have been sending him back with clock-like regularity every two years since that time.

He has won fame for himself in congress and he has won fame for North Carolina. He stands at the head of the list of Tar Heel representatives and is an authority of nation-wide reputation on all matters pertaining to waterways. He has worked wonders in Eastern North Carolina in the matter of securing national appropriations for improving harbors, making rivers navigable and building inland water-ways.

He has not devoted all of his energies to building up water transportation. A great deal of thought and energy has been expended by him in seeking to interest the people of his district and of the state in general in road building. For several years he has attended faithfully the annual meetings of the North Carolina Good Roads Association, of which he is a loyal member, and several times he has been the association's foremost speaker. One of his addresses was published in Southern Good Roads last year.

Mr. Small is a staunch believer in federal aid in road-building and at the meeting of the North Carolina Good Roads Association last month he re-consecrated himself to the cause. His advocacy of the movement means more than that can be told easily. He is a man of power in Washington and he gets results when he goes after things.

At the convention last month he came out strong for a system of national highways. He said:

"I want to take this occasion to give this expression. First, I am impressed with the idea of the federal government and the states undertaking to build a systematized series of National Highways, and the appointment of a commission to determine where the highways shall be built, and to consider all the elements that enter that problem of building highways; and then build them according to the report of the finest talent which can be placed upon them by the commission to study that great problem. The idea is a revelation to me. My thought had all along been federal co-operation with the states, appropriating so much money to be expended in the states in co-operation or in conjunction with certain money appropriated by the states and the local communities. Now, this is all right in its sphere, as I will refer to in a moment. But this idea of the federal government itself building great national highways and inter-state highways and which shall bind us all together in stronger ties; stronger than they have perhaps ever been before; stronger possibly than our great interstate line of railroads; stronger than has been consummated by the telegraph and telephone, or our admirable postal service. I am in favor, I say, of the United States building a national system of highways; and there is nothing in the constitution, nothing in our theory of government which militates against this idea.

Road-Building, Road-Boosting and Road-Boosters

Throughout the Nation

"National Roads Legislation Day," of the American Road Congress, under the auspices of the American Automobile Association, which will be held on Tuesday, September 30, will have speakers of national repute and men who have given much time and thought to this phase of the great subject. Three members of the Joint Committee of Congress on Federal Aid have already been invited, and since these three have put forward definite propositions concerning national roads legislation their Chairman Jonathan P. Bourne of Oregon, Vice-Chairman Dorsey W. Shackelford of Missouri, and Senator Claude Swanson of Virginia are the three joint committee members who have definite plans to present. Since Representative Shackelford is the chairman of the new committee on public roads of the house of representatives, it is expected that he will propose something new, as he has recently made a statement which would indicate that further thought has presented advanced phases to him.

"Road Users' Day" will also be under the auspices of the American Automobile Association, for its membership represents the most insistent class of road users, and the program which Chairman George C. Diehl is preparing promises to be an unusually attractive one. Since the man in the country is the road user who commands the greatest consideration, the usual invitation will be sent to the National Grange to supply one of its most forceful talkers. Not only is the Grange interested in county and state roads, but it has also given its influence to the national movement, contending that there is now a need for national, state, county and township roads in this multiplying use of the highways of the country.

* * *

That much of the road money spent in counties and townships is wasted through ineffective methods is recognized as "notoriously true" by the National Grange monthly, which strongly advises the local granges not to neglect the "roads near at home while taking an active interest in accomplishing great trunk highways for state and nation." It is set forth that these local roads form a part of the general scheme of highways and should receive their fair share of attention, though this is not a matter of national concern, but it does believe that more careful attention to local roads and road expenditures is imperative. It also believes that "every grange everywhere should be interested in and responsive to the larger grange policy as a whole, for good roads everywhere, state and national."

* * *

Mr. S. D. Waldon, an eminent good roads advocate of New York, declares that the roads of the future will be of two kinds, concrete and gravel. The concrete roads will be for the main lines of travel. The gravel roads will be the by-roads, bearing light traffic. He gave this striking example showing the long life of concrete pavements:

In Bellefontaine, Ohio, there is nearly half a mile of concrete streets which were laid twenty-one years ago and the repairs on which have not amounted to \$150 in that time. The wear has not exceeded one-half to three-quarters of an inch where the horses travel. These streets are easy to clean and easily kept clean. They are ideal for motor traffic and as a lasting proposition

are beyond compare. The city's experience with macadam has been less fortunate. Last December it paid off the last bond of an issue of ten-year bonds for the construction of 4,000 feet of macadam street. This is now worn out and the council is preparing ordinances for repairing it with brick.

* * *

That good roads prevent disease, is the contention of Dr. J. J. Sippey, state epidemiologist of Kansas. He says that the weeds and trash that line the poorly kept-up roads prevent the evaporation of moisture and make ideal breeding spots for mosquitoes, flies and other insects that carry disease, to say nothing of chinch bugs, hoppers, and other insects which damage crops considerably.

"Good roads also make for better drainage," Dr. Sippey asserted. "Many farms have no means of drainage except the ditches along the roadways. Open ditches, clear of brush and debris, with hardened surface and proper fall, afford these farms the opportunity of ridding themselves of many a stagnant pool. The removal of weeds, together with proper road-grading, surface hardening and oiling, insures prompt drainage of all pool, ditch and surface water, at once removing the possibility of insect breeders, for none can multiply without moisture. Road oiling in itself is destructive of insect larvae, especially mosquitoes—a well known fact.

"Dry roads offer pedestrians, and notably children who are compelled to walk to and from school, dry shoes and feet; while colds are undoubtedly due to specific germ of origin, more or less. It is a well known fact that cold, wet feet and chilling limbs lower the resistance of individuals and make them favorable subjects for infections of the respiratory passages, including pneumonia and tuberculosis."

* * *

Out on the Pacific coast they are moving for a highway to run through California, Oregon and Washington, from the Mexico to the Canadian lines. At Eureka, Cal., last month a conference was held to devise ways and means of getting it and the conference was attended by Governor Johnson, of California, Governor West, of Oregon and Governor Lister, of Washington. Governor Lister, enroute to the meeting, said this in an interview:

"I certainly shall do everything in my power to bring about the completion by 1915 of the Pacific Highway from the southern end of California to the northern boundary of Washington, without a break in the entire route. It will be a wonderful advertisement for the Pacific Coast States, and especially for Oregon and Washington, to have this great road completed and ready for service from one end to the other."

* * *

Judge William A. Falconer, of Fort Smith, Arkansas, candidate for re-election as judge of the Tenth Chancery court, had this said about his past record by one of the newspapers of Fort Smith:

"In 1902 he was nominated for county judge of Sebastian county by a majority of 102 in the democratic primary and in 1904 he was renominated without opposition and in 1906 was again renominated by a ma-

jority of 1,042. He inaugurated the movement for good roads in Sebastian county and built the first mile of macadamized road ever built in the county. He constructed over thirty miles of macadamized road and brought county scrip of both the Greenwood and Fort Smith district to par."

* * *

The Tice good roads bill which became law at the last session of the Illinois legislature, would not fit in every state but it has a great many features that other states should adopt. For instance, the following clause should be written into every state and county road bill:

"To cause to be erected and kept in repair at the forks or crossing place of the most important public roads, post and guide boards, with plain inscription thereon, in letters and figures, giving directions and distances to the most noted places to which such roads may lead, to prevent thistles, burdock, cocklebur, mustard, yellowdock, Indian mallow and gypsom weed from seeding, and to extirpate the same so far as practicable, and to prevent all rank growth of vegetation in the public highway by causing same to be cut and destroyed prior to the seeding of same, and at the farthest prior to September 1, in each and every county and the said commissioners may at their discretion, adopt any suitable and convenient mode of supplying water in troughs conveniently situated on the public highway for public use."

The Bristol-to-Washington Highway.

To hasten the completion of the Bristol-to-Washington highway, an extension of the Memphis-to-Bristol highway, a campaign will at once be inaugurated. Two scout cars will run from Bristol to Washington over the proposed route leaving Bristol about September 1. Two 45 h. p. Apperson Jack Rabbit cars have been purchased for this purpose and will be driven by Carl A. Jones and Charles J. Harkrader, who have been actively identified with the movement to build a modern macadamized highway from Bristol, diagonally across Virginia and through the picturesque Shenandoah Valley, to the national capital.

The east Tennessee counties are pushing the work on the Memphis-to-Bristol highway. Very soon the last lap of the road, running through Washington, Carter and Sullivan counties will be completed and connected up. The other counties in east Tennessee are going ahead on the movement.

The Bristol-to-Washington highway will furnish an eastern macadamized outlet for all of Tennessee as well as for the section around Bristol. The automobile highway from Bristol to the national capital was suggested by the Memphis-to-Bristol movement, and it has been aggressively promoted. Only about 150 miles of the new road will have to be built in Virginia to connect up the existing roads and thereby give a direct route from Bristol to Washington, by way of Wytheville, Radford, Christiansburg, Roanoke, Natural Bridge, Lexington, Staunton, Winchester and Berryville to Washington. The last lap of the official road will likely be by way of Harper's Ferry as the Georgetown pike into Washington by way of Falls Church is rough and in bad condition.

President Aston, of the Bristol-to-Washington highway, will be among the scouts who will leave Bristol in September. The state highway commissioner is also expected to be in the party, along with President Henry Roberts and Secretary Lester C. Busch, of the Bristol Board of Trade. Meetings will be held at

Abingdon, Marion, Wytheville, Pulaski, Radford, Christiansburg, Roanoke, Buchanan, Natural Bridge and Lexington. The highway is completed from Staunton to Washington and is in good condition, this distance of 200 miles.

The problem of road building in Virginia is not nearly so serious a one as in Tennessee, owing to the fact that Virginia has the convict system. The most of the state convicts are turned over to the various counties that desire to issue bonds for good roads. With the state aid, in the form of convict labor, the counties or rather the magisterial districts, as the roads are built by magisterial districts, are enabled to get many miles more of road of a better character than can be secured by the contract system.

The first lap of the Bristol-to-Washington highway is now being built by a force of 150 convicts. This is the macadamized road from Bristol to Abingdon. Work was begun upon it last October and is being pushed forward as rapidly as possible.

Simultaneously with the beginning of work at this



Pretty Piece of Road Between Hendersonville and Bat Cave, North Carolina.
It is Well Crowned and Drained Nearly All the Way

end of the highway, a scout car was run over the route last September, from Bristol to Washington, Mr. Harkrader, director of publicity of the highway association, along with Mr. Jones and others. The scouts were given a warm welcome all along the route and at Washington.

The completion of the Bristol-to-Washington highway, which is now an assured fact, will give an unbroken stretch for one thousand miles of macadamized highway from the Mississippi river to the national capital, by utilizing the Memphis-to-Bristol highway now under construction. This will be one of the finest stretches of automobile touring road in the United States and will attract motorists from many states, owing to the picturesque country and splendid climate of the territory through which it will pass.

The city of Tampa, Florida, has spent practically all of its \$1,750,000 street bond issue and has a fine system of streets. The city now has twenty miles of the highest type of streets, mostly vitrified brick, with some asphalt. The bond issue improved 310 blocks, averaging 300 feet in length. In addition to this about two miles of macadam street has been built, the board of public works using the old stone taken from the streets that were being improved.

GOOD ROADS NOTES

GATHERED HERE *and* THERE

Florida.

Taken from the Florida press in one day are the following good roads notes:

The good roads enthusiasm seems to be general throughout the state and we are in hopes it will continue to grow until every part of the state is accessible to those looking for investments. It is the surest and quickest way to reach the proper extent of development.—Cocoa-Rockledge News.

The more we think about that \$1,000,000 in bonds voted by Hillsborough county for brick roads, the more thoroughly are we convinced of the superior citizenship resident of that county. Every county in the state could afford to do the same thing, and the only drawback is a lack of goaheadativeness. Let all counties in South Florida follow in the wake of Hillsborough, and note carefully the result.—Inverness Chronicle.

If DeSoto county gets good roads it will get them by bonding by districts. In order to get the best results by districts the county should be redistricted. Let one district be formed by cutting through the county north and south on the township line west of Avon Park, and the territory remaining divided into four equal parts, each district running from the western boundary of the county to the Avon Park-Sebring district.—Wauchula Advocate.

Lee county, blessed with incomparable natural advantages, has lost no time in taking steps to get in the good roads procession. The county commissioners of Lee, at their meeting this week, called an election for September 9 to pass upon a \$300,000 bond issue for improved highways. The board of trade, for certain reasons, felt that it would be better to defer this election a few months, but the county commissioners thought otherwise and decided to call it at the earliest possible date. Perhaps the action of Hillsborough county had much to do with hastening action in Lee. From this distance it would appear that nothing is to be gained by deferring the election.—Tampa Tribune.

* * *

Georgia.

The people of Augusta, Georgia, are planning a big good roads congress for November in which representatives of every county in Georgia and South Carolina shall participate. It is to be known as the Georgia-Carolina Good Roads Congress and it is to be held in connection with the Georgia-Carolina Fair. The movement for the congress was started at a conference held July 24th in Augusta, at which officers were elected. These officers recently named the following executive committee, composed of prominent citizens of the two states:

Messrs. G. H. Lewin, president of the Augusta Chamber of Commerce; P. H. Rice, president of the Augusta Merchants & Manufacturers' Association; L. C. Hayne, mayor of Augusta; G. H. Nixon, chairman board of Richmond county commissioners; T. W. Loyless, editor of the Augusta Chronicle; Bowdre Phinizy, editor of the Augusta Herald; Nisbet Wingfield, Augusta commissioner of public works; James U. Jackson, president of the Georgia-Carolina Fair Association; R. O. Lombard, Richmond county commissioner; J. C. Lamar, of

South Carolina; Luther Reese, of South Carolina; T. E. Patterson, a member Georgia prison commission; J. M. Westbrook, of South Carolina; D. S. Henderson, well-known attorney, Aiken, S. C.; Judge Henry C. Hammond, of Richmond superior court; A. J. Twiggs. Asa Rooks, E. F. Verdery, county commissioner; R. E. Allen, chairman of city streets and drains committee; S. W. McCallie, state geologist; R. E. Davison, president of Georgia prison board; E. C. Stulb, hotel proprietor; M. J. Hallihan, merchant; C. S. Bohler, city tax collector; Bryan Lawrence, capitalist; E. J. O'Connor, merchant; K. C. Berckman, president State Horticultural Society; W. W. Morton, director of Georgia-Carolina Fair Association; J. M. Haynie, secretary county commissioners; J. J. Farrell, secretary Augusta Chamber of Commerce; S. J. Newcombe, hotel proprietor of Augusta; C. C. Strahan, professor of engineering at State University; D. M. Lyon, automobile dealer; C. B. Garrett, president of Augusta Automobile Association; E. J. Lyons, chairman city police commission; J. J. Evans, merchant; Frank E. Beane, president Georgia-Carolina Fair Association; Major Harry Hammond, retired; F. P. Branch, professor of engineering Georgia Tech; Warren Fair, of South Carolina; E. H. Walton, and J. A. Daly, Augusta newspaper men.

The committee on program is composed of the following members: Judge William F. Eve, president of Georgia Federation of Good Roads Authorities, chairman; Hon. E. J. Watson, commissioner of agriculture of South Carolina and Hon. J. D. Price, commissioner of agriculture of Georgia.

The committee on program will at once enter into correspondence with manufacturers of road building machinery, with the view of securing their exhibits at the congress, and with a number of national, state and locally prominent men, in an effort to induce them to address the congress.

* * *

Illinois.

The members of the new Illinois state roads commission gathered at Springfield the first week in August to take up their work. Present were A. D. Gash, of Chicago, chairman; S. E. Bradt, of DeKalb and James Wilson of Polo. Governor Dunne met with the commissioners and formally charged them with the responsibility of enforcing the good roads bill and with protecting the highway interests of the state. Incidentally, from the tone of his talk, it was drawn that the governor is depending on the work of the commission to make his administration a success. Among other things he said:

"I want you gentlemen to give to the positions to which I have appointed you the best that is in you and to work in co-operation with me for the improvement of our roads.

"Nothing that we can do will mean more to the state of Illinois than to improve its roadway. I leave to you the working out of the necessary details.

"Yours is a big job, but I think I have selected men competent to fill the places that have been given them. I place the matter in your hands and hope that when our term of office shall have ended we will turn over

to our successors a vastly improved system of roadways in the state that we have been called to serve."

Under the Tice bill which became a law at the last legislature, Illinois now has in the treasury \$1,000,000 for road-building. The commission will proceed to start work at the earliest practicable moment but preliminaries will probably delay work until next spring.

The legislature just adjourned provided for the expenditure of \$400,000 for the biennial period beginning July 1 and also for \$400,000 for the year beginning July 1, 1914. The legislature appropriated an additional \$300,000 for the general funds of the state to work in with the \$800,000 for the fees paid in by automobile owners.

* * *

Kentucky.

In Kentucky there is an ever-increasing sentiment for working convicts on the roads. The state has a highway commission, supported by the special taxes collected from automobilists, but lack of co-operation between the state and counties and the state's inability to use convict labor, are retarding development. The matter is going to be put squarely up to the voters of Kentucky in November when the question of adopting a constitutional amendment providing for the working of its convicts on the roads of the state, will be presented to them.

But even when this is done, there will be more work needed before actual results are obtained. When the amendment is adopted, the legislature must pass a bill in compliance with the will of the people, providing for the employment of convicts on public works. But even after the way is to be opened, consent of the prison contractors who control the labor of all able-bodied men in the state penitentiaries must be obtained.

It seems that the former Prison Commission let the labor of 600 men at the Eddyville and Frankfort penitentiaries to a company controlled by A. D. Martin, of Frankfort. A similar contract had been given the Hoge-Montgomery Company. When Col. Martin's Company suddenly terminated its existence, the Prison Commissioners, it is alleged, without advertising the contract and awarding the convict labor to the highest bidder, as required by law, met in secret session during the last legislature and simply turned over the Martin contract to the Hoge-Montgomery people, with the same privilege of renewal. This gives the Hoge-Montgomery Company control of the labor of 1,200 convicts on both contracts to January 1, 1916, and 600 convicts to January 1, 1919.

After the amendment is adopted and the proper legislation passed therefore, either the consent of these contractors, who control valuable labor at a great profit to themselves must be obtained or the contracts must be broken through the courts before the men actually can be put to work. Unless this doubtful consent is obtained, or the contracts broken by law, the roads must wait until 1916 for the labor of 600 men and until 1919 for the whole.

A writer in a recent issue of the Louisville Courier-Journal claims that good roads can be constructed in Kentucky 30 per cent. cheaper than in any other state of the Middle West. The reason is that most of the commonwealth abounds in limestone of the best quality, which can be ideally utilized in the construction of roads.

There is hardly a stretch of road in the entire country lying between the west line of Breckenridge, Grayson, Butler and Logan counties on the west and Lewis, Rowan and Morgan counties and the west line of Breathitt, Perry and Leslie counties on the east, by

whose side there cannot be opened a natural quarry and limestone taken out for repair or construction.

This great portion of the state abounds in an excellent quality of limestone. Quarries can be set up by the side of almost any road and the rock hauled to the work by the teams used in other road work. Secretary Ramsey, of the Louisville Automobile Club, says that at no place would the haul be more than four miles.

* * *

Louisiana.

Representative Schwing, of Iberville parish, Louisiana, is starting a movement for a system of good roads leading out of New Orleans, connecting that great city with the rural regions. He points out the greatest hindrance to the growth and development of New Orleans in the following:

"New Orleans today has no suburban roads leading to any of the interior towns or to resorts along the Gulf Coast. New Orleans today has no good roads whatever leading five miles into the interior of the state, not counting, of course, the St. Bernard road, which is generally considered part of New Orleans. Yet the people of New Orleans wonder how it is that Orleans doesn't grow, and how it is other cities are climbing up the ladder. They have not stopped to think that all other cities the size of New Orleans have made it convenient for people to live in suburban towns and at the same time carry on their business in the cities. They have not stopped to think that all other cities the size of New Orleans have considered good roads leading into it from the interior section even more valuable than trunk lines of railroad. Or, if they have stopped to think of these things, they have spent all their time in thinking and none in acting."

The New Orleans States comments encouragingly on Mr. Schwing's movement and says:

When the good roads tax of a quarter of a mill was proposed under the Sanders administration, some of the country parishes, we believe, cast their votes against it; but New Orleans rallied to its support and contributed a large majority to its ratification. Although New Orleans pays two-fifths of the tax, not a cent of it will ever be directly returned to her. She does not participate in the plan of self-help which it provides. But the people of New Orleans voted cheerfully for it because they felt that whatever benefits the country must inevitably benefit the city, and that, since what the country districts of Louisiana most need to stimulate their agricultural development is good roads, anything she might contribute to that end would invariably bring to her indirect returns.

* * *

Maryland.

The biggest thing in Maryland is the city of Baltimore and what Baltimore is doing in the way of street improvement interests all Maryland and nearly all of the south, for Baltimore is the south's great trading center. The Manufacturers' Record recently outlined the work being done in Baltimore, noting the fact, among other things, that the \$2,430,000 total of contracts already awarded by the Paving Commission of the city of Baltimore indicates the broad nature of the work planned by the commission in the improvement of the streets of the city. Of the \$5,000,000 loan authorized, \$2,500,000 have been appropriated since the organization of the commission, May 31, 1911, leaving \$2,500,000 yet to be appropriated, probably at the rate of \$1,000,000 per year. But in addition to this amount, the property tax on frontage improved by the new paving is expected to largely increase available funds,

possibly to the extent of \$500,000 per year, making in the course of the next few years \$10,000,000 available for street paving improvements. This is for original construction alone, and may be still further increased by future action. Repair and maintenance expenses are appropriated to be expended under the City Engineer's Department.

* * *

Minnesota.

The state highway commission will soon have developed for the state a complete system of arterial roads. The commission is now sending to all county boards requests that 10 per cent of the road mileage be designated as roads suitable for improvement as state highways. These are to be indicated and returned to the commission.

John H. Mullen, assistant to Engineer G. W. Cooley, will make a comparison of these maps and will designate as state roads only those that can be made part of a definite system.

Approximately \$1,000,000 will be spent in road improvement this year by the state. Next year it is expected \$1,300,000 will be spent. This will enable the rapid development of the 10 per cent of the road mileage entitled to state aid. So far the state has spent \$2,500,000 on its roads, largely without system.

Mr. Mullen has estimated the cost of the various roads per mile. Concrete roads of the type recommended cost \$11,000, gravel roads \$3,000 and macadam \$6,000.

* * *

Missouri.

Missouri's two good roads days were entirely successful. Nobody had hoped for the wonderful response the call for two days of road-making met and national attention was focussed on the "Show Me" state. Governor Elliott W. Major, the enterprising chief executive who issued the call, summarized results of the last day, August 21st., as follows:

"At least 250,000 men have worked on the roads in the state during the two days, making a total of 500,000 days, the equivalent, at \$2 a day, of \$1,000,000 worth of improvement.

"The work done by grading equipment loaned in various districts, plus free material furnished by counties and contributed by commercial establishments, can safely be estimated at \$300,000.

"The amount of cash contributed by citizens of counties and cities is easily \$200,000.

"Thus the actual labor on the roads, plus material and cash, will safely make the grand total in the state \$1,000,000.

"A good roads spirit has been kindled which will bear rich fruitage for many years to come until Missouri has a system of good roads not equaled by that of any other state in the union.

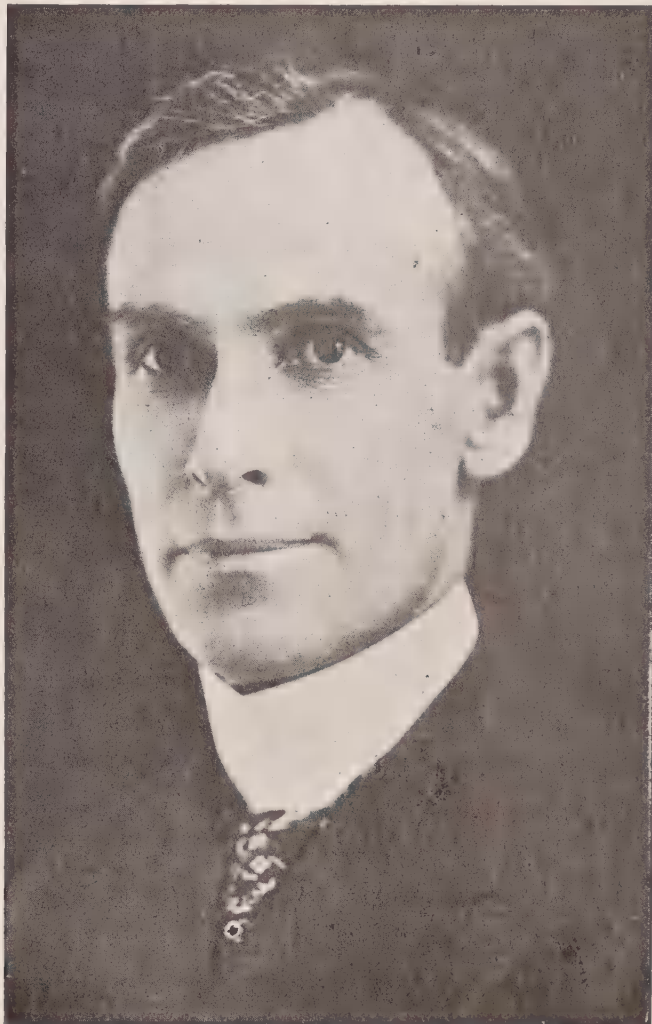
"The spirit awakened by the two good roads days has not been confined to Missouri. It has become nation-wide and has met with favorable comment by the press of Europe.

"These two days have been such a splendid success that I expect to make the same days good road days in 1914 and will call upon the governors of other states to devote the same days to the same purpose in their commonwealths.

"These things will be potent factors in inducing the federal government to appropriate out of the \$1,000,000,000 it expends every twelve months a goodly sum to aid the states in building highways, which, in the finality, is the most valuable internal improvement the nation can have."

Governor George H. Hodges, of Kansas, was on hand to aid Governor Major the second day of the "road-building bee" and was delighted with the whole affair. He announced that he would join with Governor Major next year in proclaiming good roads days and would help to bring the matter to the attention of the nation. He made a short address at Columbia, Mo., in which he said:

"I come as the representative of your sister state of Kansas to congratulate Missouri on the good roads history which she has written yesterday and to-day. Gov. Major is to be congratulated upon a suggestion which



GOVERNOR E. W. MAJOR, OF MISSOURI

has undoubtedly resulted in much benefit to your roads.

"What we need in this country is federal aid in road building. The National Government, is spending too much for military armament and too little for internal improvements.

"Kansas is telling her congressmen to work for federal aid in road building, rather than for an occasional post office.

"I want to give my endorsement to Gov. Major's good road days movement and will next year join him in a general call for road work."

* * *

North Carolina.

One of the best addresses that was made at the meeting of the North Carolina Good Roads Association last month was made by Hon. John H. Small, represen-

tative in congress from the First North Carolina district. He spoke for a state highway commission, backed by adequate funds and properly organized and equipped. He said:

"We stand at the threshold of better public roads in North Carolina, and to my mind, the primary essential is that we shall have a highway commission, a commission accompanied by sufficient appropriation to pay a man of ability at the head of it. By the way, we cannot get any more appropriate man at the head of this highway commission than that man who is now, with finest ability, simply acting upon his own inspiration and sense of civic duty, and love for his job—Mr. Pratt. We should have an appropriation sufficient to pay him and also employ one, two or three highway engineers, or as many highway engineers as we require, and among those, one or two to go among the folks, and preach the "Gospel of Good Roads." How many public schools are there in North Carolina levying taxes? Nearly 2000, are there not? How is it that it has been possible to induce 1500 rural districts in North Carolina voluntarily to go to the poll and levy a tax for public schools upon themselves? It is because we have been sending missionaries; because we have been sending inspired St. John the Baptists into these various sections and talking education to these people. We must have a systemized organization, a highway commission, clothed with power and fortified with sufficient appropriation to furnish these missionaries to go among the people; engineers who can go here and there where the people desire them to give them information and educational talks about how to build their public roads. Why has not North Carolina that highway commission? There is absolutely no excuse except the lethargy of our people. I am ashamed of my state and the condition which I am going to portray to you in just one moment.

"In my congressional district, I have ten calls for a highway engineer, and I have to go to the Office of Public Roads and beg for an engineer. I am ashamed that this great state of North Carolina with all its pride of history, and its pride in itself, that it should be dependent upon the federal government in order to obtain the services of a highway engineer to meet the demands of our people. I cannot conceive why our last two legislatures have failed to provide a highway commission. There are some things which a state cannot afford to deny itself. No community is so poor that it can afford to fail to provide an opportunity for the training of every child in that community, and the state of North Carolina is not so poor that it cannot provide this highway commission. If we, who are here, would return to our respective counties, and interview our members of the general assembly and the state senators and let them know the demands of the people, we would get that highway commission, and we won't get it until then. If we get this highway commission with a live man at the head of it, ready to create sentiment, and ready to respond to sentiment when it is created, we will reach the civic consciences and arouse the convictions of the farmers of North Carolina. I have faith in our farmers; I have been among them, and know them, and when you put before them a man in whom they have confidence, they are not niggardly; they are not narrow; neither are they parsimonious. All you have to do is to appeal to their better nature, to their pride as citizens. Let us organize this highway commission, let it send its missionaries among the people, and it will be one of the strongest factors we can create to solve for us this question of 'More Roads and Better Roads.' "

Tennessee.

Within the next few weeks visitors throughout East Tennessee, between Chattanooga and Knoxville, in the counties of Hamilton, James, Bradley, McMinn, Monroe, Loudon and Blount will notice the large number of buttons bearing the insignia, "Chattanooga-Athens-Knoxville Highway Association" on the outer edge of the button, and "concrete road" in the center, says the Nashville Democrat. These buttons will designate the wearer as a booster for the great permanent highway project for a concrete road between the two principal cities of East Tennessee, Knoxville and Chattanooga. They will also show that the wearers have contributed one dollar or more to the \$5,000 fund which is being raised by the executive committee to make the survey of both proposed route via Athens, Sweetwater, Loudon and Lenoir City and via Athens, Madisonville and Maryville and other expenses incurred in carrying on the campaign, which it is believed will result in the building of the road. T. R. Preston of Chattanooga and Joseph J. Price of Knoxville have already started their local campaigns to raise their pro rata of \$1,250 each toward the fund, and the executive committeemen from the various cities and towns between the two terminal cities are at work, raising their part of the fund. The executive committeemen who have the sale of the buttons and securing subscriptions for the fund are Joseph J. Price, Knoxville; T. E. Cooper, Maryville; Frank Weiss, Lenoir City; C. H. Bacon, Loudon; S. C. Burgess, Philadelphia; John M. Jones, Sweetwater; J. C. Burn, Niota; Luther Emerson, Athens; T. F. Peck, Etowah; Col. T. E. H. McCroskey, Madisonville; George L. Hardwick, Cleveland; Ed Robinson, Ooltewah; and T. R. Preston of Chattanooga.

In addition to the work of preparation now being done by the officers and members of the executive committee in preparing for the survey and campaign to follow the convention, McMinn and other counties have started movements of their own leading to the building of a mile or more of concrete highway along the proposed route in order to show to the citizens of these counties the superiority of this form of permanent

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highway over the old style of macadam or dirt road. It is understood that a similar plan is being worked out in Blount county. The strongest competition has been aroused between the two competing sections for the routing of the permanent concrete highway.

* * *

Texas.

The town of El Paso, by reason of its location, is getting on a number of important national highways. Only one of the important southern routes seems destined to miss that town and that is the trans-continental road backed by the National Old Trails Association, which will probably be run through the deserts of northern New Mexico and Arizona.

El Paso is already on the Borderland Route, the best of them all, the only route at present open the year round, and it is on the projected Southern Highway, which will be another all year route and one that many believe will be the first built with government aid, because it is southern and has the backing of the democrats in congress.

There are two more highway propositions that are also coming El Paso's way. One is known as the New York and San Francisco Highway and takes a more northerly course than the Southern highway. The other is the San Antonio-San Francisco route. A meeting to decide through which towns the New York-San Francisco road will run in Texas was recently held at San Angelo, and it was routed from Brackenridge, Stephens county, to Albany, Abilene, Ballinger, San Antonio, Sterling City, Garden City, Fort Stockton, Alpine, Marfa, Valentine, Sierra Blanca, and El Paso, the west state line. Going north the route already mapped out extends from Brackenridge to Mineral Wells, Weatherford, Fort Worth, Dallas, Terrell, Greenville, Sulphur Springs and Texarkana, the state line.

BRIDGES AND CULVERTS

A bridge is to be built across the Chattahoochee river at Columbia, Alabama. It will cost \$3,000 and will be operated by a stock company.

The town of St. Petersburg, Florida, and Pinella county, will construct a bridge across Booker street at a cost of \$20,000.

The commissioners of Bibb county, Georgia, will build four re-inforced concrete bridges at a cost of about \$15,000.

Colquitt county, Georgia, is to hold an election soon to vote on a bond issue of \$400,000, to build bridges and culverts.

The second ward of Richland parish, Louisiana, has voted a tax to build a \$10,000 bridge across Bouef river, the second ward to pay half of the cost and the police jury of the parish to pay the other half.

Brazoria county, Texas, is considering a bond issue of \$60,000 for the building of a number of bridges across Brazos river.

From Columbia, Virginia, comes the information that Fluvanna, Cumberland and Goochland counties are interested in the building of a bridge across the James river. The estimated cost is \$20,000.

A movement is on foot to bridge Staunton river near Brokneal, Virginia. Two counties are interested. Campbell county has already made an appropriation of \$5,000 on condition that the town of Brokneal raise \$3,000 and Halifax county \$2,000.

Plans have been drawn for a 3-span suspension bridge across Brazos river at Waco, Texas. The cost will be \$40,000.

The county commissioners of Davidson county, North Carolina, have let a contract for the construction of three bridges in the county.

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GOOD ROADS NOTES IN BRIEF

Bishop, Texas, starts street improvement with the proceeds of a bond issue of \$14,000.

Boonville, Missouri, has voted \$25,000 of bonds for street improvement.

In Smith county, Texas, Bullard district has voted \$30,000 of bonds for road building.

Sanford, Florida, has issued bonds for \$50,000 for general street improvement.

On the 25th of this month Road District, No. 5 of Waller county, Texas, will vote on a bond issue of \$15,000 for road work.

The city of Baltimore, Maryland, has contracted for bituminous concrete paving to the amount of \$32,000.

Polk county, North Carolina, has awarded contracts for fifty miles of sand clay road, twenty feet wide.

Webb county, Texas, has contracted for the construction of one road at a cost of \$22,000.

Contracts for street paving amounting to \$24,600 have been let by the street authorities of Louisville, Kentucky.

The city of Waco, Texas, has contracted for additional paving to the amount of \$34,845.

Wise county, Virginia, has awarded contracts for the construction of ten miles of roads.

Baltimore, Maryland, has contracts to award for street paving amounting to more than \$150,000.

Benton county, Arkansas, will spend \$23,000 in permanent road improvement.

Natchitoches, Louisiana, has been asking for bids on 40,000 square yards of paving.

The city of Raleigh, North Carolina, is asking for bids on 40,000 square yards of asphalt macadam or asphalt concrete pavement.

Road bonds to the amount of \$375,000 have been voted in two different precincts of Smith county, Texas, since January first this year. The money will be expended, \$300,000 in Tyler district and \$75,000 in the Lindale road district. Winona and Bullard districts are expected to call elections for road bonds some time this month.

Alexandria, Louisiana, voted bonds for \$14,000 for street improvement.

In Chambers county, Texas, road district No. 1 has issued bonds for \$100,000 for road building.

District No. 2, Brazoria county, Texas, has voted \$150,000 of bonds for roads.

Of special interest to the people of Arkansas is the announcement that the new highway from Forrest City to Memphis is about completed. The formal opening of the road was scheduled for the first of this month. The road opens up a fine section of country and will be the means of large development, especially in the region of Shell lake, where a magnificent club house is to be built by Memphis and Forrest City people.

The county commissioners of Floyd county, Georgia, have instructed the county clerk to take up with the Georgia delegation in congress the question of securing a branch of the proposed Johnston-Sherman highway through this county. The present plan makes the nearest point to Rome, Kingston, in Barrow county which is seventeen miles away. The historic fact is, however, that while Sherman's army did not visit Rome, other troops were frequently in and out of that section, and for several months a detachment of federal soldiers made that point their headquarters and directed military operations from there.

At Mt. Winans, Maryland, a bridge is to be built across one of the principal streets by the state roads commission and the Pennsylvania railroad to cost \$80,000.

Polk township, Nodaway county, Missouri, has \$30,000 to spend in building concrete culverts and bridges in various parts of the township.

The commissioners of Davie and Forsyth counties North Carolina, held a joint meeting last month and decided to build a bridge across the Yadkin river. It is estimated that the bridge will cost \$25,000 and legislative sanction for the expenditure of that sum has already been secured.

Cotton county, Oklahoma, will build a steel bridge across Red river, 1700 feet long, with double drive way.

A bond issue of \$17,500 has been authorized in Hickman county, Tennessee, for the building of a bridge across Duck river, connecting the towns of Centerville and Shipp's Bend.

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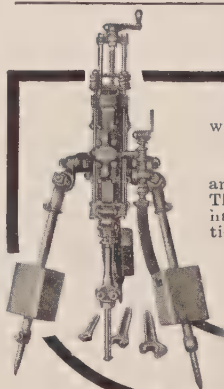
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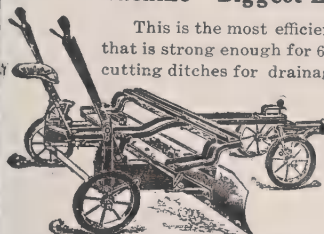
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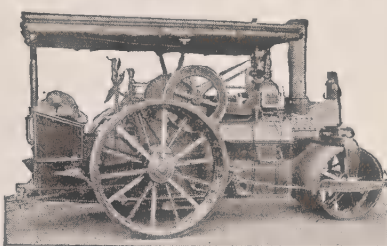
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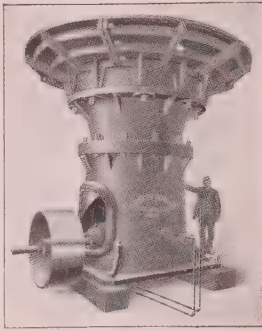
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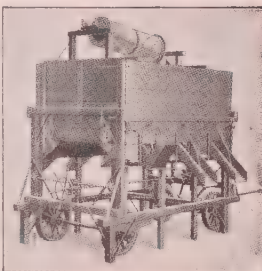
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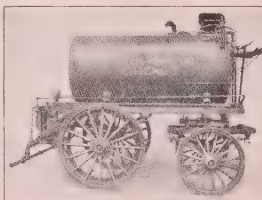
Austin Gyrotory Crusher



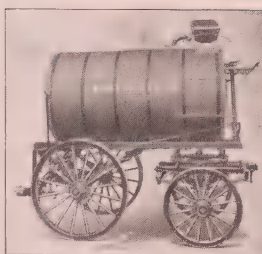
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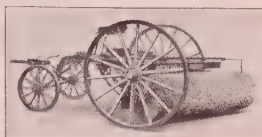
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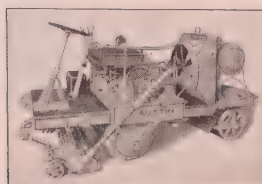
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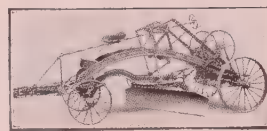
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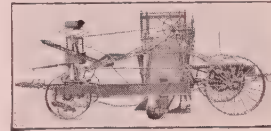
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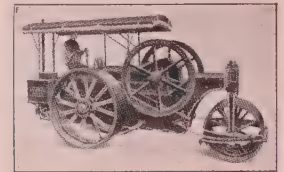
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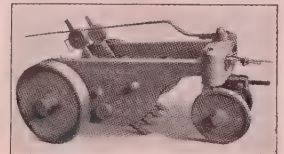
Giant Grader



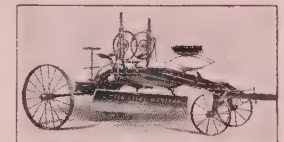
Elevating Grader



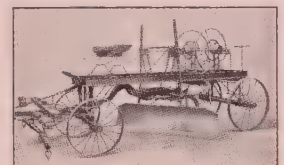
Austin Motor Roller



Austin Scarifier



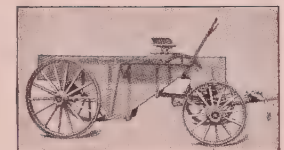
Little Western Grader



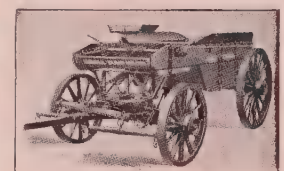
Western Grader



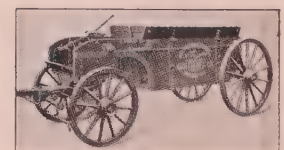
Austin Grader



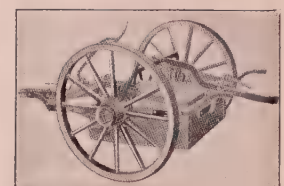
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Aurora Dump Wagon



Austin Dump Wagon



Western Wheeled Scraper

The Austin = Western

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It is the only complete line manufactured entirely by one concern, sold and guaranteed direct from factory to user.

Numerous branch offices and warehouses established in every section of country, insure prompt and efficient service to our customers.

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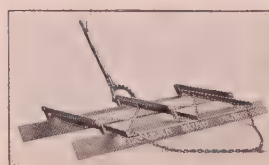
ROAD MACHINERY CO.

CHICAGO

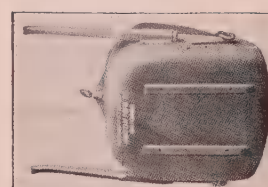
New York City
Dallas, Texas
Durham, N. C.

Syracuse, N. Y.
Atlanta, Ga.
San Francisco and Los Angeles, Cal.

St. Paul, Minn.
Memphis, Tenn.



Road Drag



Drag Scraper

Southern Appalachian Good Roads Convention, Asheville, N. C., Oct. 22, 23
Southern Commercial Congress, Mobile, Ala., Oct. 27, 28, 29

SOUTHERN GOOD ROADS

A MONTHLY MAGAZINE DEVOTED TO HIGHWAY AND STREET IMPROVEMENT

Vol. VIII. No. 4.

Lexington, N. C., October, 1913

10c. a Copy

Tarvia
*Preserves Roads
Prevents Dust*

Cleveland's Experience with Tarvia

CLEVELAND'S experience with Tarvia has been very satisfactory. Tarvia has been used on the various roads in the parks and in the boulevard system. The following is taken from the Annual Report of the Department of Public Service.

"On the West Side, Edgewater Park and the Boulevard, the roads were treated two years ago with a surface coating of Tarvia and hence only needed a renewal coating of the same material with silica sand. This renewal cost was quite small and the results satisfactory. We would recommend a similar periodical re-coating for the East Side roads about every other year.

"The results we have secured from the methods of re-surfacing and repairing, as above set forth, are such that we hope the general plan may be continued on the park roads not already repaired. This form of construction offers a hard resisting surface to traffic and thoroughly preserves the road, whereas in our opinion, the normal disintegration of the macadam roads has heretofore been hastened by oiling. The oil seems to be lacking in binding quality and tends to break up the macadam surface."

"Tarvia X" is a dense, viscid coal tar product of great cohesive and bonding power for pavement and road construction. "Tarvia A" and "Tarvia B" are lighter materials of the same nature for dust suppression and road preservation. "Tarvia X" and "Tarvia A" require heat for application. "Tarvia B" is applied cold. As a rule a tarviated road lasts so much longer than ordinary macadam that the cost of the Tarvia treatment is more than saved.

Booklets on Request

BARRETT MANUFACTURING CO.

New York, Chicago, Philadelphia, Boston, St. Louis, Cleveland, Pittsburgh, Cincinnati, Kansas City, Minneapolis, Seattle, Birmingham, Ala. THE PATERSON MFG. CO., Ltd.—Montreal, Toronto, Winnipeg, Vancouver, St. John, N. B., Halifax, N. S., Sydney, N. S.



Wade Park, Cleveland, Ohio. Treated with "Tarvia A."

AZTEC ASPHALT

THE BEST FOR

**Sheet Asphalt
Asphaltic Concrete**

**Asphaltic Macadam
Penetration Method**

Has received the highest endorsement from asphaltic experts, contractors and engineers.

Is now being laid on heavy traffic streets of New York ; also laid in Philadelphia, Pittsburgh, Chester, Scranton, Erie, Rochester, Albany, Troy, Toronto, Detroit, Providence, Baltimore, Washington, D. C., Norfolk, Paterson, Passiac, Charlotte, N. C., and many other places.

Pure bitumen

Great Cementing
Strength
High Ductility



Low susceptibility to
Temperature Extremes
Economical

Uniform

AZTEC LIQUID ASPHALT

FOR OILING ROADS

Is a road preservative and dust layer combined in one. It possesses the quality of thoroughly penetrating the interstices of the macadam roadway, leaving upon evaporation a hard asphalt which firmly binds the stone making a plastic surface.

It should not be confused with heavy residual sludges or ordinary dust layers. Is without a peer as a road oil and has given eminent satisfaction wherever used. Has been applied with excellent results to dirt and gravel roads as well as macadam.

Write for Booklets

THE UNITED STATES ASPHALT REFINING COMPANY

90 West Street, New York

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Baltimore, Md.

"HARRY'S" Genuine Open Hearth Iron Culverts

(99.875 PURE IRON)

As installed by Mr. W. L. Wiggs in Wake County, North Carolina



Our Culverts can't talk, but---

They certainly speak for themselves. Ask any County Road Engineer or County Commissioner in North or South Carolina what he thinks of our Culverts after using them and we are more than willing to be judged by his statement. We have sold more carloads of Culverts in North Carolina than all others combined.

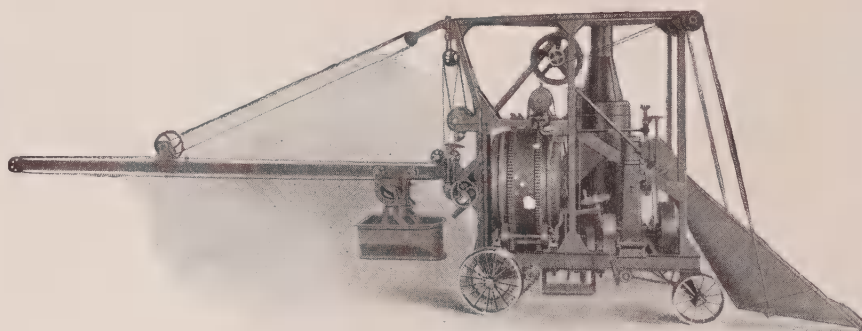
Let us tell you why.

HARRY BROS. COMPANY, Inc.

NEW ORLEANS, LA.

NEWPORT, KY.

**Only One Minute
to Mix, Deliver
and Spread
with a**



KOEHRING Street Paving Mixer

THIS MACHINE marks a revolutionary change in paving and construction work. It is another elimination of slow labor for quick machine work. Takes the place of several men, saves the contractor their wages and quickens the work. A reputation maker---a contract getter. The

KOEHRING Street Paving Mixer

is an essential part of the equipment of every contractor who expects to compete with modern methods and get the most from his jobs.

Does three things in almost a continuous action---mixes, delivers and practically spreads concrete; one man tends it without leaving machine. Concrete is conveyed by large bucket, holding full contents of drum, to end of long boom---20 to 30 feet long---and then dumped clean and spread while bucket returns to drum to repeat operation. Boom has universal joint and conveys concrete above or below machine and at any angle from side to side. A great thing for conveying concrete and spreading on streets.

The drum has three distinct mixing motions, keeping contents in a constant and complete agitation, every particle completely co-mingling with a mass. Hence it takes less cement than other mixers and produces a better concrete.

Mixer has traction drive and by pull of clutch follows course of work. Also has charging bucket for quick loading of mixing drum.

Every live contractor must sooner or later adopt this equipment. Why don't you look further into it now? Your name and address will bring information.

KOEHRING MACHINE COMPANY, Milwaukee, Wis.

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J. F. Donahoo,
8th Floor, Woodward Bldg.

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SOUTHERN GOOD ROADS

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Lexington, N. C., October, 1913

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Fifth Annual Convention of the Southern Appalachian Good Roads Association October 22-23

THE FIFTH Annual Convention of the Southern Appalachian Good Roads Association will be held in Asheville, North Carolina, on October 22nd and 23rd in the auditorium of the Langren Hotel. This hotel will also be made headquarters for the association.

Membership in this association embraces the Southern Appalachian portions of Virginia, West Virginia, Kentucky, Tennessee, North Carolina, South Carolina, and Alabama, whose interests are more or less common because of similar topographic conditions, and consequently similar problems to be met in road-building. Since the organization of the Southern Appalachian Good Roads Association in 1909, the good roads cause in this wonderful section of our country has made great progress. Counties and townships have issued bonds for permanent road construction, individuals have subscribed money toward the building of links of inter-county and inter-state highways; and now we have great interest aroused in the Southern Ocean-to-Ocean Highway, which is now being logged by the Scouting Party of the American Automobile Association, and will have for one of its links the Central Highway of North Carolina.

This convention of our association will be of peculiar interest in that it is quite possible that the governors of these eight Southern Appalachian states will be present at the convention and preside over different sessions. Tentative letters of acceptance have been received from:

Governor Mann, of Virginia.
Governor Hatfield, of West Virginia.
Governor Hooper, of Tennessee.
Governor McCreary, of Kentucky.
Governor Blease, of South Carolina.
Governor O'Neal, of Alabama.
Governor Craig, of North Carolina.

It is also expected that the Honorable William Jennings Bryan, Secretary of State will be present on this occasion and make an address. Senator Jonathan Bourne, Chairman of the Joint Committee of the House and Senate on Roads has tentatively accepted to make an address on "Federal Aid." It is also possible that Hon. Josephus Daniels, Secretary of the Navy will be with us at this time, and make an address. Hon. W. W. Finley, president of the Southern Railway will

make a short talk on "State Aid in Road Construction."

Other speakers will be Hon. Charles Henry Davis, president of the National Highways Association; Hon. Jesse Taylor, president of the Ohio Good Roads Federation and vice-president of the National Highways Association; Hon. A. G. Batchelder, chairman of the Executive Board of the American Automobile Association; Hon. P. St. J. Wilson, Highway Commissioner, of Virginia; Honorable Robert C. Terrell, Highway Commissioner of Kentucky; and Hon. E. J. Watson, Commissioner of Agriculture of South Carolina; Hon. S. W. McCallie, State Geologist, of Georgia; Hon. R. F. Freeman, Commissioner of Revenue and Roads, Decatur, Georgia; Hon. A. D. Williams, Chief Road Engineer, of West Virginia; W. S. Keller, State Highway Engineer of Alabama; William G. Sirrine of Greenville, S. C., who is interested in the Greenville-Asheville Highway.

There are a number of organizations in this section connected with the Southern Appalachian Good Roads Association which will be represented by their president or some other officer as follows:

Southeastern Kentucky Good Roads Association—Hon. N. R. Patterson, President, Pineville, Ky.

Kentucky Good Roads Association—Hon. Joseph F. Bosworth, President, Middleboro, Ky.

Lakes-to-Gulf Good Roads Association—Hon. Pendleton Beckley, President, Louisville, Ky.

Alabama Good Roads Association—Hon. John Craft, President, Mobile, Ala.; J. A. Rountree, Secretary, Birmingham, Ala.

Virginia Road-Builders Association—Hon. C. B. Scott, President, Lynchburg, Va.

Georgia Federation of Road Authorities—Hon. William F. Eve, President, Augusta, Ga.

North Carolina Good Roads Association—Hon. H. B. Varner, President, Lexington, N. C.

East Tennessee Good Roads Association—Hon. Henry R. Brown, President, Greenville, Tenn.

Knox County Good Roads and Park Association—Hon. Cyrus Kehr, President, Nashville, Tennessee.

South Carolina Good Roads Association—Hon. Fingal C. Black, Secretary, Columbia, S. C.

Central Highway Association—Hon. H. B. Varner, President, Lexington, N. C.

Central Route Association of Georgia—Capt. H. H. Tift, President, Tifton, Ga.

Greater Western North Carolina Association—Hon. J. H. Cohen, Manager, Asheville, N. C.

Asheville-Buncombe County Good Roads Association—Hon. E. C. Chambers, President, Asheville, N. C.

There will also be present many road engineers and professors of highway engineering from various colleges, who will be prepared to discuss and answer questions relating to engineering features in road building. Among those who are expected are:

Prof. C. M. Strahan, University of Georgia.

Prof. Good Homes, University of South Carolina.

Prof. T. F. Ilickerson, University of North Carolina.

Prof. W. C. Riddick, North Carolina College of Agriculture and Mechanic Arts.

There will be a special line of discussions in regard to the building of branch roads leading from the through mountain roads, such as the proposed Crest of the Blue Ridge Highway, the Asheville-Greenville, Asheville-Spartanburg, Knoxville-Atlanta, Bristol-Washington Highway into the Piedmont sections of the state.

Other questions which will be discussed in considerable detail are:

Maintenance of Roads.

Use of convicts on the public roads.

Imperative need of State Highway Commissions for giving Engineering Assistance to counties.

This latter subject has become a more or less vital one in most of the states interested in our convention, and a great deal of discussion will be invited on this question.

Sand-Clay Roads.

The Road Engineer, his status and authority in the county.

Grove Park Inn has most kindly invited the governors of the different states to attend as their guests, and the headquarters for the convention will be the Langren Hotel.

The Southeastern Passenger Association has granted special rates over all the territory included in our association except the state of West Virginia, and most favorable rates have been given.

The city of Asheville will entertain the delegates and the visitors will have the opportunity to examine the sand-clay roads of Buncombe county, which have given splendid satisfaction, and also visit the convict camp and see the actual employment of the convict in public road work.

We believe by getting together men from various sections of our country with their varied experiences and ideas, that many problems can be gone into and at least partially solved, which will advance the good roads cause in our Southern Appalachian region; and will, therefore, help in the development and building up of this splendid section of our country. Since the organization of our association the co-operative spirit has gone abroad and our people are beginning to realize that each cannot live to himself, but all must work and strive for the common good. The object of this association is to bring the states together rather than sections of one state, and work for the up-building of what is generally regarded as one of the most magnificent sections of our country; one, which is endowed with wonderful natural resources, magnificent scenery, and delightful climate, and which, with the building of good roads, will undoubtedly become the playground of the Atlantic Coast.



Fine Macadam Road Along the Swannanoa River on the Biltmore Estate, Near Asheville, North Carolina

Good Roads Proclamation

By **HON. LOCKE CRAIG**
Governor of North Carolina

State of North Carolina,
Executive Department, Raleigh.

Whereas the modern highway is essential to material prosperity, and to the advancement of the social life of every community; every people that aspires to join the forward procession and that hopes for the opportunities of our time is beginning to realize the necessity of improved roads; all sections and all progressive citizens are demanding them and determined to have them; the whole country has awakened to their importance; everywhere there is a generous rivalry to have the best, and everywhere enthusiasm for them is apparent, and increasing; and

Whereas the people of North Carolina are losing,

hood, that all the people of farm and city may enjoy the opportunities which they bring.

I call upon all patriotic people throughout the state to work upon the public roads and refrain from all other occupations on these appointed days; and I call upon every able-bodied man to shoulder his shovel, and march out and strike a blow for progress. Let the farmer, the merchant, the lawyer, the doctor, the minister of the Gospel, the rich and the poor, and the men of all the walks of life enlist as volunteers in this mighty army for grand accomplishment.

Let no man be above this work, nor forget his duty, to himself and to his neighbors. It will be an honor to every man on these days to labor with his fellowman to banish from the country the curse of bad roads and the evils that accompany them.

Let all the people of every station, high or low, be moved by the same patriotic impulse to work for the common weal. To all the benefit will come. Let all participate.

I do appoint and set apart these days, the 5th and 6th of November, that the people may have an opportunity to give substantial expression to the universal desire and determination of the state, in action inspired by hope, and rejoicing that will resound in one unbroken chorus from the mountains to the sea.

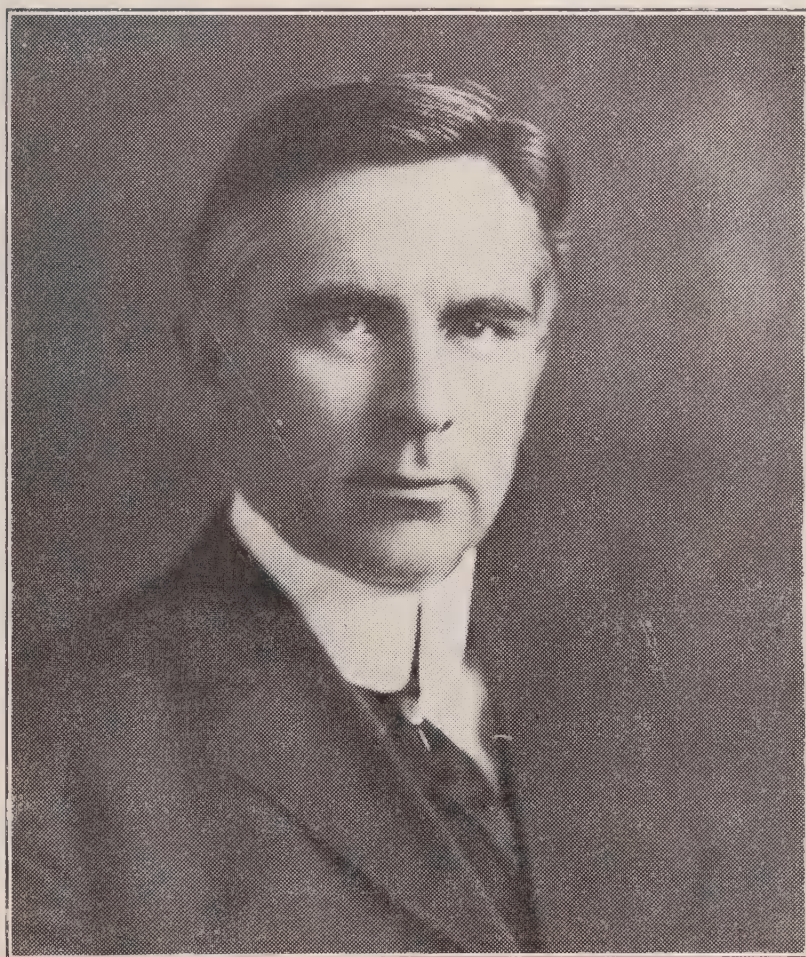
I call upon all the women to participate. In every hour of danger they have inspired the men of North Carolina with faith and courage; in this day of realization, they with their children will come to lend to this noble cause the charm and the encouragement of their presence. They can provide good things to eat, and decorate every worker with a badge of honor.

Let every citizen do his duty, and these days will be long remembered for the impetus they gave to the cause of good roads and a finer civil spirit.

I call upon the county commissioners of every county in the state to issue a proclamation urging the people to go out on the 5th and 6th days of November, and labor for the welfare of their respective counties and communities, as well as for the whole state of which they constitute a part.

I call upon the president of the Farmers' Union to issue his proclamation to the farmers of North Carolina, and to their various local organizations, that this great body of our citizenship, constituting as it does the bone and sinew of the state, may join with energy and enthusiasm in this movement. More than any other class of our people, they are dependent upon the country road. More attractive homes, better farming, and a finer rural life will result from the building of modern highways.

Let the work be completely organized so that it will reach to every neighborhood, "and be conducted in a systematic and business way, to the end that at sunset of the second day there will be no community in all



GOVERNOR LOCKE CRAIG

according to reliable estimate, twelve million dollars annually on account of bad roads—this vast sum paid as a tribute to mud:

Now, therefore, recognizing the universal sentiment for road improvement, and realizing the benefits which must result therefrom to all the people, I, Locke Craig, Governor of North Carolina, do set apart Wednesday, the 5th day of November, and Thursday, the 6th of November, 1913, as Good Roads Days, and do appoint these days as holidays and days of festival throughout the state, to celebrate the beginning of an era wherein improved highways shall be built in every neighbor-

the state where the hand of progress and toil has not left its mark in permanent road improvement, and the progressive spirit its impression in the hearts and minds of the people."

I call upon the ministers of the Gospel, the educators, and the press of the state to use their mighty influence for this work, which means not only material development, but moral and intellectual development.

I call upon all road overseers, good roads associations, boards of trade, chambers of commerce, and all associations and organizations for the public welfare and civil betterment to give to this movement the energy of their influence.

I call upon the mayor of every town and city of North Carolina to issue his proclamation that his peo-

ple may enlist in this organization, and in the building of roads upon which the prosperity of town and city depends.

Let every North Carolinian show by his work that he is for the improvement of his state. "Let us labor that we may enjoy the fruits to-day, and our children a fuller fruition to-morrow."

Done at our city of Raleigh, this the 27th day of September, in the year of our Lord, 1913, and in the one hundred and thirty-eighth year of our American independence.

LOCKE CRAIG,
Governor.

By the Governor:

JOHN P. KERR,
Private Secretary.

The Lincoln Memorial Highway

By HENRY B. JOY

President Lincoln Highway Association, Detroit, Mich.

WITH the authority to plan and the power to execute of the great Napoleon, the Lincoln way might be creditably planned and executed with dispatch from the beginning.

Many cities want it to pass their way. Many counties seek that it traverse them, and even great states press for the benefits which will accrue from its passing through.

The idealists who have energetically pressed forward the great project of a Lincoln Highway from coast-to-coast have accomplished wonders toward crys-

and organize, with headquarters at a convenient center. Some of those whose counsel and enlistment in the work they sought were at first unbelievers—scoffers at such a colossal and impossible project.

Be it noted that each and every one approached to aid in forming the permanent association, after careful investigation of the merits and possibilities of the project, enlisted in incorporating under the laws of Michigan "The Lincoln Highway," with headquarters at Detroit. The name received finally, out of scores suggested, the unanimous approval of all.

The association then set out to get the consent of all transcontinental highway organizations to the use of the name "Lincoln Highway." This was willingly conceded in a broad spirit, with promises of co-operation and pledges of active support toward whatever might be the trend of the studies and investigations as to route.

Route investigations began. All data was studied. Climatic conditions considered. Routes possible and impossible were traveled and details carefully noted as bearing on the ultimate decision which the Lincoln Highway Association was organized to make as to what route would, in its judgment, be the most practicable to become the great Lincoln Memorial Highway.

The Lincoln Highway so selected, if done wisely, will become great.

None know better than those who will assume to select the route that it is not done with Napoleonic authority or power.

The force behind the decision will be only the wisdom of it, which, it is hoped, will give the selection of route the force of Napoleon's dictum. Yes, even a greater force, because it is believed that the route of the "Lincoln Way," wisely chosen, will have behind it the patriotic force of the whole people.

The appeals of sections have been heard. The arguments of all interests have been and are being weighed.

Shall the Lincoln Way be marked on the map from large city to large city? Shall it be from point of interest to point of interest?

Shall it be a highway from New York to San Francisco, as direct as practicable, considering limitations by nature in the topography of the country?

See America first!

Cordele, Georgia, is asking for bids on about \$150,000 worth of street paving.



MR. HENRY B. JOY

President Lincoln Highway Association and President of Packard Motor Co., Detroit, Mich.

tallizing a nation-wide demand for the consummation of such a great and desirable project.

A committee of these idealists, after energetically and at their own expense pressing the propaganda to national fame and interest, decided to increase the force behind their efforts, enlist the financial aid of others and thus develop a stronger interest and support of the propaganda.

After much deliberation, they decided to centralize

Motoring Through the Sandhills

By GERALD W. JOHNSON

Associate Editor of the Greensboro Daily News, Greensboro, N. C.

ARGUING with a stubborn carbureter is a weariness to the flesh and a vexation to the spirit, as every motorist's son doth know and when a journey of 122 miles through the North Carolina sandhills lies before one, the necessity for such an argument amounts almost to tragedy. But when such necessity does arise, ignorance of the internal economy of an automobile is bliss, indeed, for the wise must sweat, while the simple may sit in the tonneau and make a critical survey of the surrounding landscape.

So it was my good fortune to sit on an August morning of the past summer, while my companion, with the upper half of his anatomy buried in the engine hood, debated the matter with the carbureter. We were stalled in the little town of Wagram, on the banks of the Lumbee river. Half an hour earlier we had left Riverton, famous as the home of the Scotch poet, John Charles McNeill. Around us stretched the cotton-fields, flecked with the white blossoms that had bloomed over-night and tinted with the red ones of yesterday. There is no more beautiful crop in the world than a field of cotton, whether you look at it in the early spring, when the young plants are just beginning to cover the earth with a tender green, and the long straight rows stretch away to infinity, "the point where parallel lines meet," or on some late September morning, when the ground is white with a fleecy snow and the song of the pickers rings through the crisp air. But perhaps at no season is such a field more to be admired than in mid-summer, when from your feet a magic carpet, softer and richer than the product of any Belgian loom, stretches away to where the horizon is bounded by the green wall of the forest.

Of such a country Wagram is the little capital. Its population consists of only a few hundred souls, but its "back country" is a marvel, for Scotland produces more cotton to the acre than any county in the world and thousands of bales are marketed in this village. It is the country of the Scotch-Americans—the "God-blessed Maes"—sturdy, independent farmers, whose three ideals in life are to fear God, educate their children and vote the democratic ticket.

At this point my meditations were interrupted by a sudden "Br-r-r-r" from the engine and an exclamation of heartfelt thanks from the perspiring owner thereof. He leaped to his seat, and we were off.

It was the famous "wire road" that we were travelling—the old turnpike, down which the stage-coaches used to rattle before the old Carolina Central railroad was built, and it gets its present name from the fact that an enterprising telegraph company many years ago ran a line of poles along it in stringing their lines from Raleigh to Columbia. The telegraph line is there still, and it forms a valuable guide to the traveller unacquainted with the route. The wire road is rich in legends; Andrew Jackson is said to have ridden along it on his way to be inaugurated President of the United States; a more luxurious traveller was the Marquis de la Fayette, then plain Citizen Lafayette, whose coach rolled down the same road when the citizen's tour through the country he had served in his youth was turned into a triumph worthy of a Roman emperor. Half a century later there came another traveller along the same highway, whose visit is still spoken of with emotion of a very

different kind from that which greeted the Frenchman. This was Sherman, on his way from Atlanta to the sea; and hard on his heels was grim Wheeler, whose swift and terrible vengeance on the traitor and the recreant is still spoken of with hushed voices.

The road is peaceful enough now. The Frenchman in his laces, the blue-clad bummers and the gray Nemesis have gone for ever. The stagecoach and its drivers have vanished, too, and even the old Gilchrist



Section of Very Bad Road Between Sanford and Cummock in Lee County, North Carolina. This Variety of Roads Will Soon be a Thing of the Past in Lee County. Good Sand-Clay Roads Are Replacing Them Just as Fast as Mr. R. P. Coble, County Highway Engineer, and Road Forces Can Reach Them

Inn, that sheltered them all alike, a few months ago soared up into the heavens in an Elijah's chariot of fire, and the place that knew it shall know it no more. Still the pike is busy enough, even yet. But instead of the gun-carriage it is now the farm wagon that rumbles heavily along; where the cavalryman galloped on his fiery charger, whizzes a charger more fiery by far, bestridden by the death-defying motorcyclist; in the place of the coach and four of His Excellency the Marquis de la Fayette, sometime general of the Continental Army and ex-Commander-in-chief of the Garde Na-

tional, there now rushes the shrieking, loud-smelling devil-wagon of such humble citizens as we.

Neither is the road itself the same, for the good roads fever long ago struck Scotland county, and where the great of long ago toiled through sand a foot deep, the little of today ride over a good sand-clay. The construction is not of the best, for there is entirely too much sand in the mixture; but it is incomparably better than the road of even a few years ago.

The county line we crossed at Gilchrist bridge, a mile from Wagram. The Lumbree is one of those tor-



BEFORE IMPROVEMENT

Bad Road on Greensboro-Fayetteville Highway, Through Lee County, North Carolina

tuous eastern streams that wind through swamps from a half-mile to three miles wide. Its course can be followed for miles by the sombre, flat-topped cypresses that rise high above the semi-tropical growth of the jungle. At Gilchrist an excellent causeway has been constructed through the swamp to the steel bridge that spans the swift, black current. The river bottom is gravelly, and the water in a glass is as clear as crystal, but the juniper-roots have stained it slightly so that the river itself is the color of clear coffee. The stream is one of rare beauty, but the glimpse of it caught at Gilchrist bridge is most unsatisfactory.

Hoke, which lies on the northern side, is one of the newest counties in the state, but it bids fair soon to be one of the best. Already it has gone extensively into

road-building, using the sand-clay construction. They have had better success than the Scotland engineers, and from the bridge to Raeford, the county-seat, a distance of 11 miles, there is but one short stretch that cannot be called admirable. That is within a few hundred yards of the bridge, at Montpelier church, where a stretch of deep sand on a slope threatens trouble for the chauffeur.

Raeford is a spick-and-span, fire-new town on the Aberdeen & Rockfish railroad at its junction with its Wagram branch. Everything in it, from the majestic cream-colored courthouse (just finished) to the neat pavement of the sidewalk (just laid) is eloquent of energy, civic pride and unquestioning faith in the future of the place. It is an evidence of the new life and the new hope that are quickening all the country round about.

From Raeford our way followed closely the twistings and turnings of the A. & R. all the way to Asheboro. From side to side we stitched with surprising frequency. We had been told that we were to cross the railroad sixteen times in the course of our journey, but it seemed nearer to sixty. Unfortunately, we forgot to count, but I am firmly convinced that our informant meant forty-six, instead of sixteen. There was one blessed fact, though, and that was that the road constantly improved.

Then we began to climb. It was real climbing, too, for notwithstanding that the grades were magnificent and the road little short of perfect, wonderful vistas began to open before us—vistas that grew constantly wider and more wonderful. We were coming into that curious geological formation called the sandhills, which is said by wise men to have been the seashore in ages past, when all the coastal plain was under water. Every one who has studied Maury's physical geography will remember that in one map of the southern states there is a little fuzzy line that stretches in a sweeping curve from Maryland to Mississippi. That line shows the course of the sandhills, where the Piedmont plateau breaks into the coastal plain. That line we were preparing to cross.

We could see the hills before us, a long blue line that differed in appearance from the mountains only in that the line of the sandhills is straight, whereas the mountains are broken by jagged peaks. There is the same wide sweep, however, the same blue color, the same sublimity in the scene.

Then we came suddenly upon a scene that provoked very different emotions. A high hill appeared to our left capped with buildings of a very unusual structure. They were raised high off the ground on brick pillars; the woodwork was painted a dazzling white. But the remarkable thing about them was the multiplicity of windows. They appeared to be all windows. Wherever it was possible the architect had put a great glass frame that swung from an iron rod in the center. And all the windows were open. It was Montrose sanitarium, the state hospital for tuberculosis.

On the left was the hill with the hospital, around which the road ran in a long curve. On the right was a steep descent into a deep valley, filled with smaller hills covered with scrub oak, and far away beyond the valley rose the endless line of hills again. Where we were the sun beat down fiercely but away on the farthest rim of the horizon a storm was marching over the slope. We could see the clouds, piled like fleecy cotton, high in the blue; and below them the gray veil of the descending rain shut off the view. The battle between science and the White Death is being fought in one of the loveliest places in eastern Carolina. If sur-

roundings eloquent of peace and rest count for anything, the doctors have a great ally in their location.

A few miles further was Aberdeen, straggling up and down among the hills. Here we crossed the Seaboard Air Line railway, and, abandoning our northwesterly course, turned directly toward the highlands.

The road had been magnificent for miles, but just out of Aberdeen it became perfect. No milder term will describe the broad, cream-colored sand-clay over which we rode such a road as good roads workers see in their dreams, an invitation to speed madness. It was sixteen feet wide, perfectly crowned, and dragged until not the smallest sign of a rut remained. The traveller was tempted to believe that, had it been level, one might have played billiards on it. The grades were easy, the curves long and gentle and even slightly banked on the outside to prevent any possibility of skidding in wet weather. On either side of the road proper the brush was cut away far enough to allow an unobstructed view on every curve. And, marvel of marvels, at every cross-road there was a conspicuous metal sign-post, giving, not only directions, but the distance to various important places!

Suddenly we spun round a curve to find lying before us a perfectly straight stretch perhaps a mile long. It sloped gradually to a hill which blocked the view. And on the crest of the hill was a huge yellow pile of a building that dominated all the country round. It was the great hotel at Pinehurst. Five minutes later we were in that wonderland set in the wilderness, bowling along the winding road—one could hardly call it a street—past the golf-links, with the great club-house, past the cottages, each set in a mass of greenery, past the tumble-down log hut, which was the only building on the place when the present owner acquired it, and which he guards with jealous care, past the other log

house, the club built of juniper logs with the bark still on, which is said to be the most expensive building on the place, and out through the gate on the other side. Even deserted as it was at that season of the year Pinehurst is a beautiful place; and its great popularity in mid-season is not to be wondered at.

By mid-day we were at Candor, famous for its peach-orchards. For a surprising distance the road runs between fields of peach-trees, set in rows as straight and regular as cotton, with here and there a huge packing-shed, deserted now, for the peaches were long since gathered, but with a litter of baskets and broken crates suggestive of the abundance of the matchless fruit they were designed to carry to northern markets.

A little beyond Candor is the stratum of white quartz that "has red gold for the winning." The mining industry has decayed of late years, but not before one mine, not far from the road we were travelling, had yielded enough of the king of metals to make at least one man's fortune. The railroad from Thomasville to Denton was built with money that Captain Jones dug out of the ground at this place. Within the last few months an adventurous northerner has decided to try the game again, and at the time we passed he had 400 workmen burrowing into the bowels of the earth. A car of coal stood on a spur track out in the woods and teamsters were hauling the fuel off to the mine as we passed.

The colossal railroad station at Biscoe puzzles one until he is told that the town was the headquarters of the Aberdeen & Asheboro before that line was swallowed up by the Norfolk Southern system. After Biscoe is Star, long to be remembered by us, not on account of its brilliance, but because near there we found, in the road that had been perfect, a mud-hole that seemed to yawn to swallow us up. There was a sudden



AFTER IMPROVEMENT

Same Road in Lee County, North Carolina, After It Was Re-Located and Sand-Clayed

clang and clash under the car, followed by a staccato protest from the engine. We had changed gears for the first time since leaving Wagram! For about 75 miles we had travelled "on the high" but in the next eight miles we were compelled to drop back to low gear three times.

But as we crossed from Montgomery into Randolph county we struck the gravel road that leads from the county line to Asheboro. This was doubtless a beautiful pike when it was first laid, but it is now sadly in need of repairs. It is full of "waves" and the motorist who dares to run over it at high speed takes a dreadful risk of seasickness. Furthermore, it is covered with sharp, loose stones that threaten tire trouble. Nevertheless, it is incomparably better than the road in the neighboring county.

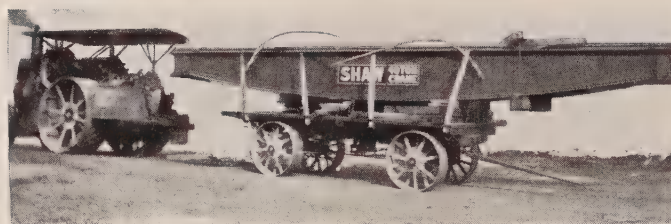
From Asheboro for about five miles the road is very good, but after that, sad to say, it is of the style typical of Randolph and Davidson counties—that is, about as bad as a road can get to be. Mud-holes, gullies and rocks, hair-pin curves and grades that look like they had been laid out by a steeple-jack, abound, and the man who can crawl over the road on the lowest speed without trouble is fortunate. Luckily, we found that the worst lasted for only about five miles; then the road constantly improved until we struck the Guilford macadam three miles from High Point. Through the Furniture City and for three miles beyond the macadam lasted, and even in Davidson the township had worked on the highway until it was fairly decent. At five o'clock we rolled into the Chair Town and our ride was over.

To me, at least, the trip was "an awakening and a glad surprise." I had heard that Moore county, in particular, had good roads, but I had not expected to find a motorist's paradise. Furthermore the character of the country was pleasantly disappointing. Of course nobody goes east for the scenery, but nevertheless, there are many vistas along this route that are well

worth looking at; and from a historical standpoint almost every foot of the way has its story. The motorist who turns toward the sandhills in the expectation of a splendid trip will not be disappointed.

Road Freight Car Carrying a 40-Ton Load.

The road freight car shown in the cut, built by the Buffalo Pitts Co., Buffalo, N. Y. is one of their standard 20-ton capacity cars used by many contractors in haulage work. The car is built with wooden frame, with steel facing and steel braces. The axles are $3\frac{1}{2}$ inch solid steel. The steel wheels are 48 inches high



and has a 14-inch tire face. The car is equipped with patent reversible gear that makes every wheel track perfectly and enables steering a number of these cars en train either front or back with perfect ease.

The tractor is also of Buffalo Pitts Co. make.

Contractors are using haulage outfits for every conceivable kind of work outside their regular field of application. The Buffalo Pitts Co. build many types of special cars on order and furnish their different types of standard cars in 5-ton, 10-ton and 20-ton capacity with patent reversible gears so that they may be coupled in one train.

The city of Anderson, South Carolina, votes on the 21st of this month on a bond issue of 75,000 for street paving.



Fine Type of Sand-Clay Road Between Sanford and Jonesboro, in Lee County, North Carolina

Highway Construction in Southwest Va.

By C. B. SCOTT

President Virginia Road Builders Association, Lynchburg, Va.

THE PERMANENT improvement of the highways of the state of Virginia was considerably accelerated by the enactment of laws providing for State Aid, by means of convict labor and money in 1906 and 1908.

Under the law establishing the State Convict Road Force, the state builds the camps, boards and clothes the convicts, and furnishes them to the counties free of charge. The counties pay for the medical attention of the prisoners, amounting to a small sum, pay the engineer, or superintendent; and foremen; provide the tools, explosives and other supplies, and teams required. By means of the convict labor from 30% to 40% of the cost of the work is borne by the state. The convicts are furnished to the counties in the order in which

Amherst County—This county was one of the first in the state to begin the permanent improvement of its roads. Bonds for \$80,000.00 were issued and a convict force began macadamizing the road from Lynchburg to Amherst C. H., a distance of 15.5 miles, and an intersecting road 6 miles in length, in 1907. Upon the



One of Virginia's Road-Building Gangs



MR. C. B. SCOTT, OF LYNCHBURG, VA.
Assistant State Highway Engineer of Virginia

their applications are filed with the State Highway Commission, and a camp usually consists of from 50 to 75 men.

Under the State Money Aid law, those counties not using convict labor receive their proportion of a fund amounting to about \$275,000.00, which is apportioned among the counties, according to the assessed value of the taxable property in the counties. The counties receiving State Money Aid are required to contribute an amount equal to that received from the state, and the joint fund is expended in highway and bridge building, under the supervision of the State Highway Commission. By this plan the state contributes 50% of the cost of the work to the extent of the appropriation available. In Virginia, the cities are not subject to a tax for road purposes, in the counties in which they are located, but, as they pay about half of the taxes of the state, they bear about one fourth of the cost of the roads and bridges built under this law.

Alleghany County has constructed a number of bridges, by means of State Money Aid, and a convict force is shortly to begin work on the roads of that county.

completion of these roads, another bond issue of \$136,000.00 was made, for the construction of a number of roads and bridges.

Appomattox County—This county has constructed several bridges, according to plans made by the State Highway Commission, and by means of state money aid. A convict force is now constructing a road leading out from Appomattox C. H.

Bedford County—Macadam roads have been built between Boonsboro and Lynchburg, from Bedford City towards the Peaks of Otter, and from Bedford City to



A Typical State Convict Camp in Virginia. Every Camp is Kept as Clean as Can be and There is Rarely Any Sickness Among the Men

wards Bunker Hill. A force is now building a macadam road from Huddleston, on the Virginian railway toward Gillaspie.

Bland County—A road has been started from near Mechanicsburg to the Bland-Pulaski county line, with the understanding that Pulaski county will complete the road from that point to Pulaski City. A force is now improving the road from Ceres towards Rural Retreat, and other work is planned. Work in this

county has been somewhat retarded by the building of a railroad, which has taken a great part of the available labor.

Botetourt County—A macadam road has been constructed from Troutville towards Fincastle 2.31 miles and 3.90 miles have been built from Fincastle towards Troutville, and it is expected eventually to close the gap in the road. The old "Valley Pike" has been resurfaced with macadam from Buchanan towards Roan-



Partially Graded Road in ■ Mountaineous Country. This Road is in Dickinson County, Virginia

oke, a distance of 3.26 miles. A convict force is now at work in that county, building a macadam road from Cloverdale to Trinity.

Campbell County—A number of short roads have been macadamized in the vicinity of Lynchburg, and other work is planned. Owing to the number of automobiles which use the roads of Campbell county, it has begun the construction of roads with bituminous surfaces.

Carroll County—This county has used state aid for building bridges for several years, and a bridge is to be built over Chestnut Creek near Galax, this year.

Craig County—The Johns Creek road, leading from New Castle to Craig Healing Springs, has been improved for 1.00 miles and the county has several bridges under contract.

Dickenson County has used State Money Aid for improving the road from Clintwood towards Coburn 10.20 miles, and has several bridges under construction. It is also grading a road from Clintwood to the C. C. & O. railway a distance of 8.25 miles by means of a bond issue of \$50,000.00 and other work is planned.

Floyd County—Bridges have been built over several streams in this county, by means of State Money Aid, and plans are made to begin road improvement.

Franklin County—A gravel road has been built from Boone's Mill towards Rocky Mount, about 2 miles, improving several bad sections of road; a joint bridge has been built over Roanoke River, between Franklin and Bedford counties, and a force is now at work on the road between Ferrum and Callaway.

Giles County has built several very important bridges over New River, by means of state aid, coupled with a bond issue of \$30,000.00.

Grayson County—A number of bridges have been built in this county, and preparations are being made to begin permanent road improvement.

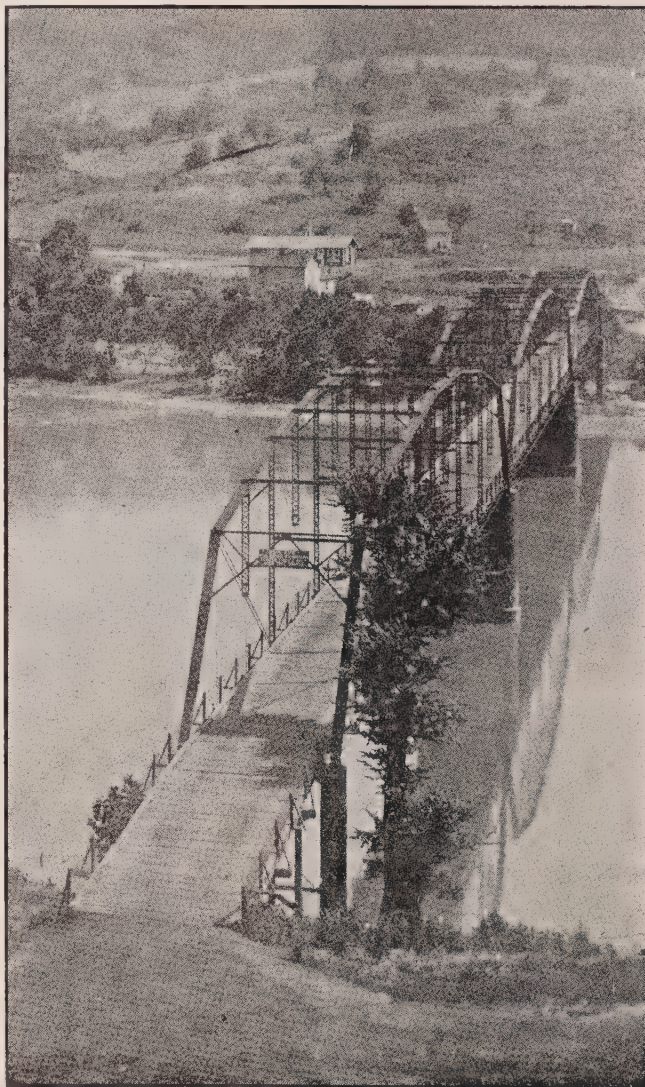
Henry County—State Money Aid has been used in Henry county for the construction of a macadam and top-soil road, between Martinsville and Mulberry-Creek, and a force is now at work on the road between Jones Creek and Hairston's Cross Roads.

Lee County—This county began the improvement of

its highways by state aid, with the construction of a macadam road, from the county seat to the railroad at Ben Hur. Bonds were afterwards issued for \$364,000 and a general system of road improvement is being carried on.

Montgomery County has built a bridge over Little River, jointly with Floyd county, and also several short macadam roads, using State Money Aid for the purpose. Surveys and estimates have been made for about 30 miles of road, in Blacksburg District, and a vote will be taken on a bond issue of \$100,000.00 in the near future.

Nelson County—The portion of the Staunton-Charlottesville Road through Nelson county has been com-



Fine Bridge Across New River at Narrows, in Giles County, Virginia
Built by State Aid

pleted, and \$35,000.00 in bonds have been voted, for constructing a road from Arrington to Roseland, and for a bridge over Tye River.

Patrick County—Several bridges have been built in Patrick county with State Aid, and more work of a similar nature is planned.

Pulaski County—Work in this county was begun with the construction of the Dora Road. The grading on a part of that road was quite heavy, but two crossings of a large creek were thus avoided. Pulaski District then issued \$70,000.00 in bonds which have been expended on a number of important roads. Dublin Dis-

trict next issued \$100,000.00 in bonds and the convict force will shortly begin work in that district.

Roanoke County—A convict force has been at work in this county for several years and has constructed macadam roads from Roanoke to Hollins, from Roanoke to Salem, and the Williamson Road, including the masonry for several bridges.

Rockbridge County—Macadam roads have been built from Buena Vista towards Natural Bridge 1.95 miles, and from Buena Vista towards Old Buena Vista 2.22 miles, as well as some other work. A force is now at work near Fairfield. State Money Aid was used on these roads.

Russell County—Permanent road improvement was begun in this county, by means of state aid in the form of convict labor, together with a bond issue of \$150,000.00. A number of roads were built, including the one from Lebanon, the county seat, to the railroad at Cleveland. Bonds were next issued for \$275,000.00. In this way a fine system of macadam roads is being built, in that county.

Scott County is expending its portion of State Money Aid, in building up-to-date bridges. This year it is building a bridge over Clinch River at Hill Station.

Smyth County—Highway construction by means of state aid began in Smyth county with the building of a macadam road from Seven Mile Ford to Chilhowie. A bond issue of \$100,000.00 was then voted in Rich Valley District, and a convict force is now at work there. The two remaining districts, St. Clair and Marion, have issued bonds for \$75,000.00 and \$100,000.00 respectively, and work has been started on a number of roads by contract.

Tazewell County—Permanent road improvement, by means of State Money Aid, was begun, and later the county voted \$625,000.00, which is being expended in building improved roads and bridges.

Washington County—This county has the distinction of being the first to take advantage of state aid, by applying for a convict force immediately upon the passage of the act establishing the State Convict Road Force. This force has been continually at work in the county since 1906 and is now building the portion of the Bristol-Washington Highway through the county.

Wise County—Roads were built between Norton and Wise, and between Big Stone Gap and Appalachia, after which the county began improving its roads on a large scale. \$960,000.00 has been issued in bonds and a considerable mileage of roads has been graded, and macadamizing is under way.

Wythe County—Macadam roads have been built east and west of Wytheville, for a considerable distance, and from Ivanhoe towards Cripple Creek, about 3 miles of fine macadam road has just been completed, from the Smyth county line towards Wytheville, which will be a link in the Bristol-Washington Highway, and a force is now at work on a road from Speedwell up Cripple Creek.

It will be seen, from the foregoing, that Southwest Virginia is actively engaged in building improved roads and bridges, and that almost all of the counties are doing work of some kind. The time can be looked forward to with reasonable certainty, when the principal roads of this section of the state will be improved.

Southwest Virginia is a section rich in natural resources and the construction of the many miles of improved roads will add to its financial prosperity, make it more desirable as a place of residence and render it more accessible to visitors and tourists.

The commissioners of Bell county, Texas, last month let the contract for 55 miles of gravel road in Precinct No. 1 for \$106,830.



Section of the Cleveland-Lebanon Road in Russell County, Virginia, High Type of Macadam Construction, Showing Difficulty in getting proper grade in that mountainous section

Road Building System of Dillon County, South Carolina

By **EDWIN M. WAYLAND, Columbia, S. C.**

A DESCRIPTION of the experiences of Dillon county in the expenditure of her bond issue for good roads and bridges may be of interest to many counties and municipalities in the south, since it should throw light on difficulties that may be expected in projects of this nature and afford suggestions for overcoming them.

The commission form of government was established in the county by act of the General Assembly in February, 1911. One commissioner from each of the eight townships was appointed by the governor upon recommendation of the county delegation, their terms of office to be for two, four, and six years. At the same session of the legislature the County Board of Commissioners was authorized to issue bonds to the amount

years. There were practically no convicts, no mules, road machinery, camp equipment, nor tools of any sort, and a debt of some \$15,000 had been incurred incident to the formation of the new county.

For the first four months the commission form of government was busy arranging the affairs of the county and getting ready for the expenditure of the bond issue. This was no small task, since there was nothing whatever to start with except a debt of \$15,000 and a lot of confidence in the future. Twenty mules were bought, with wagons, scrapers, road machines, tents, and other equipment. Few could appreciate the difficulty of getting actual construction under way until it was actually tried, and then only those directly concerned with the management.

By midsummer of 1911 the county forces consisted of about a dozen prisoners, a few free laborers, and the above equipment. A marked improvement had been made on a number of different roads, but the results were not entirely satisfactory for it was felt that no general plan of work was being followed and that the improvements were rather desultory. The necessity of having some man who should give his entire time to



Old Wooden Bridge in Dillon County, South Carolina, Which Was Recently Replaced by Re-Inforced Concrete Bridges and High Fills

of \$100,000; twenty five per cent to be set aside for construction of bridges, unusual cuts and embankments, and other expensive works, and the remaining seventy five per cent to be divided among the various townships pro rata with their taxes.

At this time the county was the baby county of the state, having just been cut from old Marion county, and no more naked baby was ever born into the world. The roads and innumerable wooden bridges were in deplorable state, having been neglected for many



One of the Four Re-Inforced Concrete Bridges That Replaced the Old Wooden Bridge in Dillon County, South Carolina

the work was seen, so it was decided to employ an engineer in accordance with the provisions of the act. For this position Mr. Edwin M. Wayland was selected and reported for duty during the latter part of July.

The problem confronting the county was a serious one, as work was needed everywhere and the money available could not possibly do it all, and, on every turn, the fact was brought home that the county had to begin from the ground and build up for there was nothing whatever to start with.

The county is roughly divided into three parts by two large watercourses, the Little Pee Dee River and Buckswamp. Into these a vast number of tributaries flow, so that the county is thickly intersected with streams that have to be bridged, and, in many places,

*Mr. Wayland was County Highway Engineer of Dillon and still retains connection with road work in that county as consulting engineer.

considerable drainage or fill work has been necessary to raise the roads to a dry level.

The soil of the county for road purposes is variable, with a characteristic tendency to run all sand or all clay for considerable areas that often makes hauling necessary for the proper mixture. With virtually no gravel whatever, the sands run from coarse to fine, but good road sand is in many places very scarce. The clays are often good, and usually obtainable without



Part of the Fill That Replaced Wooden Bridge. Bridge Shown in Distance

excessive hauling, though there are notable exceptions. A very troublesome condition is that met with in passing through rich agricultural loams with clay subsoil, where an excess of clay has to be used on the road and then stiffened with sand hauled from a considerable distance.

A map of the roads of the county was made, and from this a careful study to determine what main thoroughfares could be improved so as to furnish a connected system that would serve the most people at least expense. As a part of this plan, it was decided to bridge with reinforced concrete structures and earth fills across the Little Pee Dee River in one place, across Buckswamp in two places, and across several smaller streams where these roads crossed. Also a long causeway with concrete bridges was built to the river bridge of the Little Pee Dee at a second point.

During the latter part of 1911 the county chain-gang was busy several months building this last named approach to the Little Pee Dee from the county seat, and putting in four concrete bridges. This was very heavy work, and but small progress could be made in miles. In midwinter this work was completed and the gang moved to easier ground. Though handicapped by the unusually severe winter weather, the results of its work was fairly good in cost and quality. By the time the tough weather began to break up, the gang was in good working shape and began turning out roads of standard excellence with very creditable speed.

But the roads at large over the county were in many places practically impassible on account of the wet freezing weather and years of neglect. The problem was not in building new roads, but to patch the holes in the old ones so that they could be traveled.

As the chain-gang was too heavy for this emergency work, and its proper place was on permanent road construction, it was decided to try several small floating gangs composed of a white foreman, or leader, with a wagon, two mules, four or five laborers and tools to do this emergency work. These gangs were

not found economical, however, for it was not possible to pay enough for the leader of so small an outfit to get a good man, and the plan resolved itself into the formation of a floating gang of free labor that did nothing but repair work. This gang carried about twenty men and ten or a dozen mules with light camp equipment. Its work was excellent, though necessarily light in character as it did not attempt any hard-surface work.

The county forces were entirely too small to afford any appreciable relief all over the county, even if their entire time had been given to patching the worst places, so recourse was had to hiring farmers here and there along the road to do the patching so that the roads could be travelled. This hired work was a most unfortunate necessity, for the work was done by men unaccustomed to it, without proper tools, at times when it suited their convenience, and they often took very little interest in the results. The common human failing of believing that in order for road material to be good it must be put in a wagon and hauled somewhere, was very evident.

In the early summer of 1912 another new causeway was begun across the Little Pee Dee River. The old causeway consisted chiefly of an old wooden bridge about a quarter of a mile long, and practically every stick of timber in it was unsound. The nearest material available for making the fill was three quarters of a mile distant. The project consisted of building three bridges, of 28, 84 and 44 feet span, respectively, and an embankment requiring 13,000 cubic yards of material. Reinforced concrete construction was adopted throughout for the bridges, the smallest of the three being built by county forces and the other two by contract. The fill was made by using a light steel tramway that was laid down the road from the hill to the old bridge. The cars on this track held 45 cubic



Re-Inforced Concrete Bridge in Dillon County, South Carolina, Taking the Place of a Wooden Structure, Part of Which May be Seen at Right of the Picture

feet each, and were drawn by a mule to each car in motion. In this way one mule easily pulled enough to make two good two-horse loads as carried by wagons. The cars were loaded by hand in the cut, and dumped over the edge of the old wooden bridge or from a trestle for that purpose, no time being lost at either end. The track, cars, etc., paid for itself and about \$1,000 over on this one job, against the next cheapest method.

It is an interesting fact also to note that the main-

tenance cost on the old wooden bridge was at least equal to the interest and sinking fund costs on the new bridge with fill complete. This does not take into consideration the fact that the time is rapidly approaching when suitable timber for wooden bridges cannot be had at any cost within reach.

The two road camps—the chaingang and the floating gang have been consolidated into one, and are devoting their entire time to the construction and maintenance of certain specified highways that will form a connected system throughout the entire county, fitting in with the work above described. This consolidated camp is turning out an average of four miles of road per month at a cost of approximately \$275 per mile. This figure is based on the actual cost of the gang complete, and the excellent roads that are being turned out on this basis are possible only with a perfect organization working smoothly with all unnecessary expense eliminated.

The maintenance problem, as always, has proved the most difficult. Dragging by farmers along the road has given too variable results to bear making a general statement. In some cases the results have been excellent and extremely economical; in others, quite the

Among the greatest lessons that have been learned from the experience of Dillon county is the absolute necessity of a clear understanding of what is to be done and how it shall be done, before any particular thing is tackled, the necessity of giving fully as much thought and care to maintenance as to construction of roads, and the economy of concrete bridges with no maintenance cost whatever in place of wooden bridges and culverts that are always requiring attention.

Joplin Good Roads Boosters.

The News-Herald, of Joplin, Missouri, laughs long and loud at the people of Springfield, a considerably larger city, who strained terribly last month to raise \$500 for the two good roads days. The News-Herald notes that a Springfield bank with assets of \$2,200,000, gave \$4 and big business men of that city contributed amounts ranging from \$1 to \$4. The News-Herald calls attention to the fact that Joplin has raised nearly \$50,000 by private subscription for building roads in Jasper county, during the last 18 months. The News-Herald says:

The Western Good Roads Association raised \$18,000, and about 250 members of the organization live in Joplin. Another good road project of Jasper and Newton counties is the scenic road along Shoal creek valley, and about \$27,000 was raised by voluntary subscription for the highway.

On the Springfield-Joplin road a few men subscribed \$150 a month to carry the western section of that project through. The Joplin men also subscribed liberally on the new road from Duenweg to Granby and also to the Fidelity road. Joplin will have about \$95,000 to spend in the special road district.

The big amount for the special road district makes it unnecessary to raise any money for the good road days, Wednesday and Thursday, of this week.

The Joplin-Springfield Rock Road Association is pushing work on the county line road to Sarcoxie.

Joplin has undertaken to complete seven miles of this part of the road, commencing at the Carthage and Neosho road, thence east to the southwest corner of the Sarcoxie special road district and from there Sarcoxie builds it on east to the county line, then Mount Vernon builds it from the Jasper county line to the east line of Lawrence county, and Springfield is supposed to complete it.

C. W. Bowman has held meetings of the farmers at different places along the line of the road and has succeeded in securing subscriptions to the amount of \$7,000 to be used in building the seven miles mentioned above.



Dr. Wade Stackhouse, Chairman of the Road Commission of Dillon County, S. C., inspecting one of the good roads built by his commission.

contrary. The results depend on the personality of the men themselves. The county invested in a motor truck of a tractor type, suitable for hauling loads up to three tons and pulling loads behind, like loaded wagons or road machine on comparatively hard roads. This is undoubtedly the most powerful agent in the county for maintenance work, as it combines power for heavy work with speed for work at a distance, and costs in proportion to work actually done. The first and most important maintenance is given by the construction gang on those sections of road which have just been completed. These sections are within easy reach for maintenance if the road construction is carried on in continuous lines, and can be given the constant and frequent attention by competent men that is absolutely essential to their life. No sand clay road can be "fixed" and then left to take care of itself without dire results. The road must be nursed along carefully until it has "gone together" with a smooth compact surface. After that stage has been reached, comparatively little maintenance is necessary, provided it is regularly and intelligently applied. The plan of maintenance by section men has been discussed in this county, but not adopted.



Making Preparatory Excavations For Installing Metal Culvert in Gaston County, N. C. See advertisement of Dixie Metal Culvert Co. on page 37

Plans for Convention of the American Road Builders' Association.

Plans for the Fourth American Good Roads Congress, to be held under the auspices of the American Road Builders' Association in the First Regiment Armory, Broad and Callowhill Streets, Philadelphia, Pa., Dec. 9-12, are being worked out in detail by the convention committee and officials having the matter in charge.

The following outline of program shows the subjects to be discussed at this convention:

Subject A—ORGANIZATION.

1. Highway Officials—Their Duties and Powers.
2. Division of Expense, of Responsibility and of Authority Between the various Municipal and Other Units Participating in a Road or Street Improvement.
3. The Relation to Each Other of the Contractor, the Chief Engineer, the Resident Engineer and the Inspector.
4. Details of Arrangements for the Use of Convict Labor.

Subject B—CONSTRUCTION.

1. The Proper Determination of the Amount of Re-Alignment and of Grading to be Done.
2. The Factors Governing a Proper Selection of a Road or Street Pavement or Surfacing.
3. Materials and Methods Suitable for Road Surfaces.
4. Unit Price vs. Lump Sum Contracts.
5. Plant Equipment.
6. Preliminary Traffic Census.
7. Efficiency and Economy of Using One Size Crusher Run Stone Bituminous Concrete Pavements as a Substitute for Bituminous Pavements Constructed by Penetration Methods.
8. Dirt Roads.

Subject C—MAINTENANCE.

1. Sub-Organization for Securing Efficient Maintenance.
2. General Methods of Repairs and Renewals.
3. Methods of Dust Prevention.
4. Maintenance of Different Road Surfaces.

The general plan of providing for discussion of subjects, rather than long papers, which has been so successful in the past will be adopted at this meeting.

The speakers are being selected with reference to their fitness to discuss the various questions, and announcement of these assignments will shortly be made. The list of speakers will include the men who are recognized as the leading authorities in the United States and Canada.

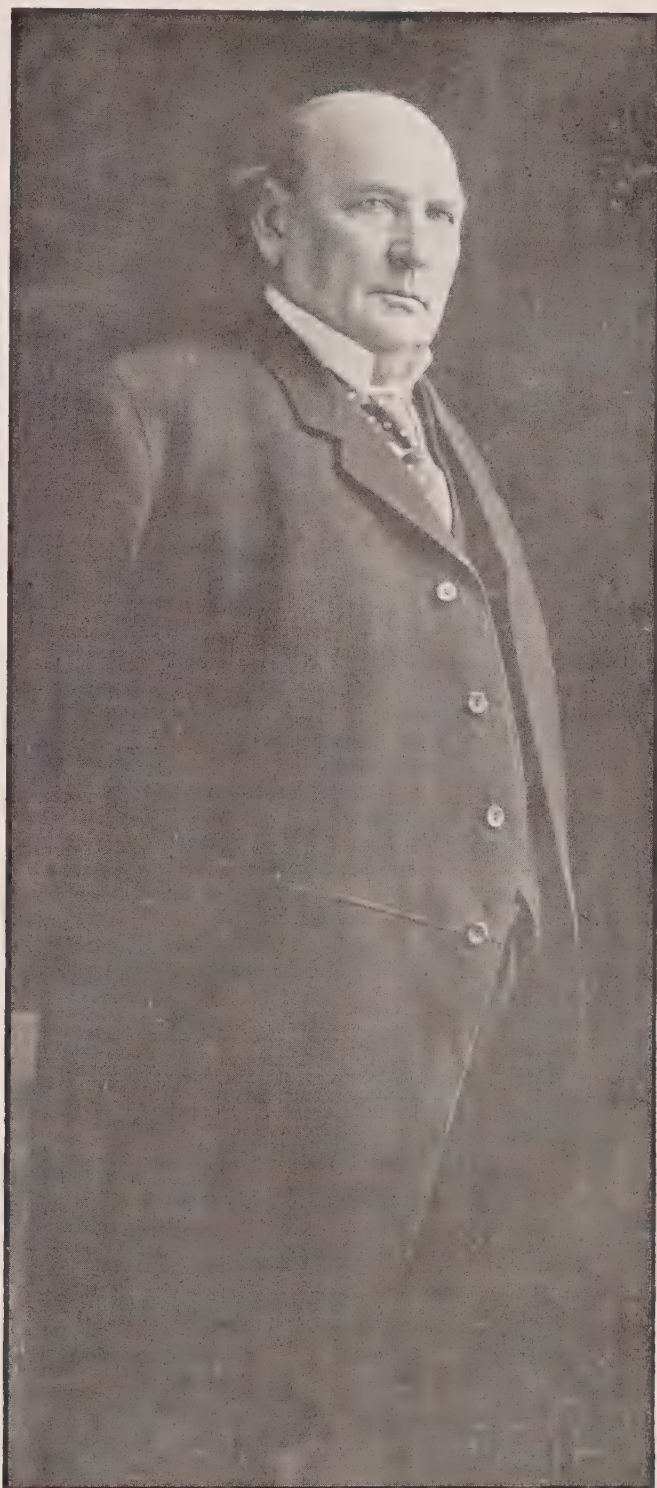
In connection with the congress and convention, there will, as usual, be held an exhibition of road machinery, materials and appliances. This exhibition will be known as the Fifth Annual Good Roads Exhibition and will include everything that enters into the construction, repair and maintenance of roads and pavements. This exhibition will also be held in the First Regiment Armory.

This association was the first to inaugurate these exhibitions and they have uniformly been successful, each have been larger and more complete than the one previous.

Applications for space have been coming into the headquarters of the association very rapidly and there is every indication that all the available space will be applied for long before the opening of the meeting.

* * *

New Decatur, Alabama, will macadamize streets at a cost of \$150,000.



SENATOR JOHN H. BANKHEAD, OF ALABAMA

Senator Bankhead is President of the United States Good Roads Association Which Holds Its Second Annual Meeting at St. Louis, Mo., Nov. 10-15

One of the largest and most complete road exhibits ever put on in Kentucky was made at the state fair at Louisville, September 15 to 20. It consisted of road models displayed on 1,000 square feet of floor space and showed each and every character of road in different stages to completion, and models of the most modern and up-to-date machinery for building roads. There were types of culverts, subsoil drainage and other features of road building. There was given daily an illustrated lecture by a representative of the national department at Washington.



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DR. JOSEPH HYDE PRATT, }
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Official Organ Southern Appalachian Good Roads Association

DR. JOSEPH HYDE PRATT, President, Chapel Hill, N. C.
HENRY B. VARNER, Secretary, Lexington, N. C.

Official Organ of the South Carolina Good Roads Association

F. H. HYATT, President, Columbia, S. C.
FINGAL C. BLACK, Secretary, Columbia, S. C.

Official Organ of the Virginia Road Builders' Association

C. B. SCOTT, President, Lynchburg, Va.
C. L. SCOTT, JR., Secretary, Harrisonburg, Va.

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No. 4.

SOME PLANS FOR THE FUTURE.

With this issue Southern Good Roads becomes the official journal of the Virginia Road Builders' Association and Mr. C. B. Scott, of Lynchburg, Va., president, will edit a page for his association in every issue, beginning with the November number.

Beginning also with the November number, the North Carolina Good Roads Association will have a page of its own, with Miss H. M. Berry, of Chapel Hill, assistant secretary of the association, as editor.

The South Carolina Good Roads Association, of which this magazine is the official publication, has named Prof. F. Horton Colecock, of the University of South Carolina, as editor of its page and his department will be ready for the November number.

It is the desire of Southern Good Roads to give the associations it represents the very best service possible and we feel that the editors named are the best that could be secured. We are very fortunate in being able to engage their services. Mr. Scott has an interesting survey of road conditions in southwestern Virginia in this number. He is assistant state highway engineer of Virginia and is in close touch with the road situation in his state. Miss Berry, who will direct the North Carolina department, is in the employ of the North

Carolina Geological Survey and is in closer touch with road improvement in North Carolina than any other person in the state, with the possible exception of Dr. Joseph Hyde Pratt, state geologist. Writing of Professor Colecock, Mr. F. H. Hyatt, president of the South Carolina Good Roads Association, says: "Professor Colecock is one of the best posted men in the state in the matter of good roads and I am glad to know that he has consented to act in this matter for the South Carolina Good Roads Association."

GOOD ROADS DAYS.

We are publishing in this issue the good roads proclamation of Governor Locke Craig of North Carolina and parts of the good roads proclamations of Governor Morehead, of Nebraska, Governor Colquitt, of Texas, and Governor McCreary, of Kentucky. As has already been noted in this magazine Governor Hays of Arkansas, Governor Major, of Missouri and Governor O'Neal, of Alabama, have already had good roads days in their states. Governor Carey of Wyoming set apart September 27 as good roads day and personally led the hundreds of workers who went out from Cheyenne to work on the roads.

Down in Arkansas the governors of four states got together and worked on the roads with men of all classes and conditions. Governor Hays was assisted by Governor Hall, of Louisiana, Governor Hodges of Kansas and Governor Major, of Missouri, and all of the governors put in a good day's work. No humble citizen in any of the road gangs did better work than the chief executives of those four great commonwealths.

The idea is a great one. Some papers have sneered at it and said that the work was poorly done and worth nothing, but these papers failed to see the biggest thing about it—the moral effect of the movement and the interest it stirs up in the good roads cause. A great volunteer roadbuilding movement will do more to boost the good roads cause than all of the speeches ever uttered and we are glad to see the movement spreading. Eventually, every state in the union will take to it.

THE SOUTHERN COMMERCIAL CONGRESS.

While it is probable that the good roads cause will receive but little direct attention at the Southern Commercial Congress that convenes in Mobile, Alabama, on the 27th of this month, we confess to no little interest in its work and in its plans for the future.

The Southern Commercial Congress is something more than an annual meeting. It is an organization that has done things and is now doing things and it is growing bigger and better every year. It was organized in 1908 and is not yet five years old, but in that time it has brought about the formation of the Permanent American Commission on Agricultural Co-operation, which, under the auspices of the United States government, and with the endorsement of President Wilson and the Department of State, completed this year a three months' tour of fourteen European countries for

the purpose of studying agricultural credits and agricultural co-operation. The findings of this commission will undoubtedly result in the establishment of a national rural banking system for farmers and will finally lead to the adoption by the farmers of our country of the co-operative buying, selling and farming methods which have done so much for the farmers of Europe.

The Southern Commercial Congress is striving with all the power it possesses to bring two things to pass. First, it would bring about a proper understanding and

appreciation of the wonderful resources of the South to the end that the people of the South may realize that upon them rests the responsibility of building a greater nation through a greater South; and, second, to clear up any misunderstanding that may exist in the world as to the south's resources, its people, its prospects and its opportunities.

It is a voluntary, non-political combination of southern forces, ready to attempt anything within the range of possibility for the up-building of the South and its people.

The South Asks For the Fourth American Road Congress

The Third American Road Congress at Detroit Sept. 29 to Oct. 4, was a great success in every respect. There were more than 10,000 visitors in Detroit for the meeting and the entertainment offered was of the very best.

The congress was welcomed to Detroit at the opening session, Monday, September 29th, by Mayor Oscar B. Marx, and Vice President Charles B. Warren of the Detroit Board of Trade, President Logan Waller Page, of the American Highway Association, and President Laurens Enos, of the American Automobile Association, responded to the addresses of welcome on behalf of their respective organizations.

The list of papers, published in Southern Good Roads last month, engaged the serious attention of the delegates. The discussions were very interesting and instructive. To the hundreds of good roads officials from all parts of the nation who had gathered there they proved immensely helpful.

There were more than a hundred manufacturers' exhibits, showing all kinds of improved road machinery. A large part of these exhibits were arranged in the pavilion of the Wayne Gardens but for the heavier machinery, such as road-rollers, traction engines, and the like, large tents were provided.

The U. S. Office of Public Roads exhibited two series of miniature models, one showing the development of road construction from the early Roman roads up to the highest type of road in use now and the other showing the various kinds of road construction now being done in the United States. This exhibit attracted a great deal of attention and was always surrounded by a crowd.

A feature of the congress was the active campaign waged by the city of Atlanta for the next meeting of the congress. There was a big delegation of Atlantians on the ground the opening day, headed by Prof. Charles M. Strahan, of the University of Georgia; Prof. T. P. Branch, of the Georgia School of Technology; Hon. W. T. Winn, commissioner of Fulton county; Secretary Fred Houser of the Atlanta convention bureau and Chairman Shelby Smith, of the Fulton county commissioners. These gentlemen argued that the south is the logical section for the next meeting of the congress, because of its awakenig on the road question and that in the south the congress is greatly needed as a means of educating the people to the importance of road improvement.

The Manufacturers' Record, backing up the southern delegates, sent President Page a long telegram, admirably summing up the arguments in favor of holding

the next meeting in the south. The telegram follows:

"Not only because of the fact that the development of the south means the enrichment of the nation, but because of the fact that the south is alive as probably no other section of America to road building, the Manufacturers Record would urge that the next session of the American Road Congress be held in the south. This section is now spending at the rate of over fifty million dollars a year in the building and maintenance of roads; many millions of bonds have been voted during the last 12 months, and many millions more will be voted in the near future for the furtherance of road building. This section is testing every variety of material in road building. The coming of the congress to the south next year would be of tremendous interest to every member. It would afford to thousands who have never before had the opportunity of seeing the south an occasion to visit this section, to study its resources and to see the magnificent work it is doing in road building. There is no other place in America which could offer to the members of the congress greater attractions for its next session than the south.

"The progress which the south has made during the last quarter of a century should appeal to the patriotism of every lover of his country, and those who have not for themselves seen this wonderful development would, if the next road congress be held in the south, have the opportunity of studying for themselves a development which is the marvel of the world.

"With a population of 33,000,000, as compared with 50,000,000 as the population of the United States in 1880, the south is doing a far larger business than the entire country was doing in 1880. It has \$700,000,000 more capital invested in manufacturing than the United States had in 1880. The value of its agricultural products exceeds by \$900,000,000 the value of the agricultural products of the United States in 1880. The south is mining 50,000,000 tons more of coal than the United States then mined. It is producing three times as much petroleum; it has more individual deposits in its national banks than the entire country then had, and it is now spending \$90,000,000 a year on the maintenance of public schools, compared with a total of only \$78,000,000 for the United States in 1880. These are but typical illustrations of this amazing progress from the overwhelming poverty following the war, but they are merely indicative of the still greater progress which awaits this section.

"Let the American Road Congress come south and

see for itself what this section has achieved against obstacles greater than any other country of modern time has ever faced, and then it will have a fair conception of the limitless growth of the coming years, and then it will understand why the south is making such magnificent progress in road building."

As Southern Good Roads goes to press the next place of meeting has not been determined on.

Southern Good Roads was represented at the congress by Mr. H. B. Varner, editor and general manager. Its booth in the exhibit hall was visited by thousands of delegates.

Officers of the Association

The American Highway Association held its annual

election of officers and re-elected Hon. Logan Waller Page president and Mr. J. E. Pennybacker secretary. Other officers elected were:

Field Secretary—Charles P. Light, Wheeling, W. Va.

Treasurer—Lee McClung, Washington.

Vice President—W. W. Finley, president of the Southern Railway.

Directors—A. B. Fletcher, of California; Alfred Noble, Joseph W. Jones and Charles W. Baker, all of New York; James S. Harlan of the Interstate Commerce Commission; Roy D. Chapin, Detroit; L. E. Johnson, president of the Norfolk and Western Railroad, and Thomas G. Norris, Arizona.

Fifth Annual Convention of the Southern Commercial Congress, Oct. 27-29

THE Southern Commercial Congress will hold its fifth annual convention in Mobile, Alabama, October 27 to 29. While all of the meetings of the congress from its beginning have been interesting and fruitful of results, the fifth annual convention of the Southern Commercial Congress holds far deeper meaning than has attached to any previous convention. Other meetings have accomplished much more than their design embraced but added to the nation-wide scope of the program for the Mobile convention it has the character of an historical event because it is an international celebration of the opening of the Panama Canal.

It will inspire a wider, more thorough study of inter-American economic, trade and production than could possibly be brought about in any other way. It will result in a permanent and increasing appreciation by the world of the great work now nearing completion.

The state of Alabama at its greatest sea-port, Mobile the nearest important port to the Canal, has been selected as the host of the convention.

International importance will attach to the program from day to day, and at this convention will be presented the report of the Permanent American Commission on Agricultural Co-operation, which spent three months with the aid and recognition of the leading foreign governments in careful study of rural credits.

The convention theme will be: "The Relation of the United States to the Panama Canal, to Latin-American and to World Commerce."

The convention program includes a cruise to the Panama Canal by the delegates, where a bronze tablet commemorating the late Senator John T. Morgan, "Father of the Canal Idea," will be placed in the Zone; a squadron of United States warships, a conference of the commercial executives of the country under direction of M. B. Tresevant, president of the New Orleans Association of Commerce; a convention of the Woman's Auxiliary of the Southern Commercial Congress, of which Mrs. Woodrow Wilson is Honorary President, and Mrs. Thomas M. Owen, of Alabama, is President General, and a great trade pageant in Mobile.

Of especial significance will be the participation of the Latin-American Republics in the convention. These countries will be represented by delegates and their diplomatic representatives in Washington.

Dr. Clarence J. Owens, of Maryland, Managing Director of the Southern Commercial Congress and Director General of the Permanent American Commission on Agricultural Co-operation, which returned last July from a three-month's study of agricultural co-operation and rural credits of Europe, will report the com-

mission's investigations to the convention.

After the convention ends the Southern Commercial Congress will conduct a trade expedition, comprising commissioners appointed by the governors of the states, mayors of the largest cities, and commercial organizations, to South America and Central America. This expedition will be gone three months in a chartered steamer of the United Fruit Company, sailing from Mobile, and will visit every commercial center of the Latin-American Republics.

The greatest array of speakers that ever attended a convention in this country will address the delegates, who will number 10,000 representative business men of the nation. President Wilson, Secretary of State Bryan, and Secretary of the Navy Daniels are among the speakers. Besides these more than two score of the most prominent citizens in the United States are on the program, including Governor O'Neal of Alabama, Director General John Barrett, of the Pan-American Union, Senor Morals, Panamanian Minister to Washington, Minister Pezet of Peru, Minister Calderon of Bolivia, Mr. John M. Parker of Louisiana, Col. Harvie Jordau of Georgia, Col. Clarence Ousley of Texas, Mr. Bradford Knapp of the Department of Agriculture, Gen. Julian S. Carr of North Carolina, Mr. J. Rice Smith of Virginia, Mr. Claude N. Bennett of Washington, D. C., Mr. William Boyce of Chicago, Col. D. C. Collier, president of the Panama-California Exposition; Lieut. Col. William L. Sibert of the Isthmian Canal Commission, Senator Duncan U. Fletcher of Florida, president of the Southern Commercial Congress and Chairman of the Permanent American Commission on Agricultural Co-operation, who will deliver the annual address; Senators Bankhead and Clayton of Alabama, Senator Vardaman of Mississippi, Senator Smith of Georgia, Senator Ransdell of Louisiana, Prof. E. E. Johnson of the Isthmian Canal Commission, Representatives Hobson, Heflin and Taylor of Alabama, and many other congressmen and business leaders of the country.

President Wilson's address, the big feature of the convention, will be delivered on the evening of the 27th. His subject will be "The Panama Canal and our World Relations."

Hon. Joseph Daniels, secretary of the navy, will be the leading speaker of the closing session on the 29th. His subject will be "Panama and the American Navy."

General Julian S. Carr, of Durham, N. C., is scheduled for an address on "Panama and Tobacco Exports" and Hon. W. J. Bryan, secretary of state, will make an address on the subject "Farther South."

Road-Building, Road-Boosting and Road-Boosters Throughout the Nation

"It is universally acknowledged that good highways mean increased prosperity for the farmer, and wherever automobiles are owned there will good roads be found as soon as they can be built," says George W. Bennett, vice president of the Willys-Overland company. "Many short-sighted people have claimed that the purchase of an automobile by a farmer is an extravagance. I maintain that it is one of the most foresighted economies he ever introduced, and I think the majority of the successful farmers of the United States will agree with me."

* * *

Senator Monk, of Clark county, Wisconsin, has been instrumental in having passed a bill regarding the piling of dirt in roads. The bill reads as follows: "It shall be unlawful for any highway superintendent or any other person having the supervision of the building, re-building or repairing of any highway to place any materials in the traveled tracks thereof, in piles or rows without leveling the same off before sunset of the same day or placing upon such piles or at both ends of such rows a red gas lamp or lantern lighted within one hour after sunset and containing sufficient oil or fuel to keep the same burning from dark until daylight; and in grading or repairing any highway it shall be unlawful for such highway superintendent or other person to place sod or stones in the center or tracks therein without rolling or otherwise bringing the same down to a smooth and even surface with the remainder of the travel track. Any person violating any of the provisions of this subsection shall be punished by a fine of not less than ten nor more than a hundred dollars."

The senator must have had some experience in bumping along over country roads after an old-fashioned road-working. Every southern state ought to have just such a law.

* * *

Speaking of the honor system that prevails in the convict road camps of Colorado, Warden Tynam, of the Colorado state prison, says:

"During the last three years we have had more than 1,000 individual prisoners in the convict camps. These men without guards—some three hundred miles away from the prison—have created a national reputation for loyalty; less than one per cent have violated their pledges by successful escape. Communities no longer fear to have our convict camps established near them. We have made manhood as well as money by this healthy, hearty and humane treatment. We lift the prisoners up both physically and morally. Men discharged from road camps do not have the prison pallor, the physical weakness and the hang-dog appearance you will see in the typical discharged convict. They are bronzed, sturdy, healthy, efficient laborers and are in demand as such. About 80 per cent of those we have sent out upon the completion of their sentence have made good. The other 20 per cent have mostly found their way back into prison somewhere."

An unknown Kentucky good roads booster states the connection between good roads and good health in this way:

"When an invalid goes for his first drive he goes upon the road. When a baby goes for a walk, he is

taken along the highway. The aged and infirm, called forth by necessity or desire for the best that comes from change, breathe the air of the road. It ought to be good air. It cannot, if the road be diversified by mosquito breeding pools, carpeted clean up to the roadway with dank and matted weeds, littered with filth, or permitted to become knee deep in dust."

* * *

From Albuquerque, New Mexico, comes this story of a "booster" worth while. It is related that Mr. N. M. Cudabae, proprietor of the Model Store, of that city, has made an offer to donate to the cause of good roads 10 per cent of the gross receipts of the Model Store, the percentage to be taken on any Saturday or pay day during September or October by a properly appointed committee. There are no strings to the offer of the proprietor of the Model, the only stipulation being that other merchants of the city join in the proposition.

Mr. Cudabae's idea is a particularly meritorious one as by united action on the part of the merchants of Albuquerque not only would a considerable sum of money be contributed to the good roads movement, but the general interest in the subject would be effectively stimulated.

* * *

The constitution of the Ohio Good Roads Federation reads:

"We urge the adoption of a comprehensive and efficient plan of administration that will improve, maintain and unify as one complete system the public thoroughfares of the country—to the end that we may secure:

"A national highway system;

"A state highway system;

"A county highway system;

"A township highway system;

each a distinct unit, yet all integral factors of a complete system of 'Good Roads Everywhere.'"

* * *

In an account of a great good roads day at Albuquerque, New Mexico, when the inhabitants of that city turned out to build in a day a road twelve miles long connecting Albuquerque and Isleta, appeared this interesting bit of news:

"Word was received at the Good Roads meeting last night that the Isleta Indians, to the tune of 200 strong, with 35 teams would turn out and work the road south of Padillas on Good Roads day. This is a great help. The Indians will work exclusively with their own teams but will have local men as foremen, this being a condition of their turning out. Their work was arranged through P. T. Lonergan."

Good for the noble Red Man.

* * *

Mr. D. E. Colp, of San Antonio, Texas, secretary of the Bexar County Highway League, director of the Texas Good Roads Association and connected with several other good roads organizations in Texas, became a member last month of what is known in Texas as "The Two Hundred Club." Membership is limited to automobilists who drive their own cars 200 miles over country roads in their own counties, in ten hours or less time, without traversing the same road more than

twice. Mr. Colp put Bexar county on the map as the only county in the United States in which it has been possible thus far to pull off the stunt and the "Two Hundred Club," at last accounts, had a membership of only one.

It is required that the two hundred miles be covered without stopping the engine, without going over any road or part of that road more than twice and within the time limit of not less than nine nor more than ten hours. The owner of the car must drive and can have no assistance except in tire troubles.

Mr. Colp's performance is the more remarkable when it is related that he retraced his course only once, going back over 23 miles of road. This would not have been necessary except for the heavy rains of the day before which had put some of the roads in too bad shape to be travelled at the rate he was compelled to go. His time was 9 hours and 33 minutes.

* * *

Dr. Thomas Nelson Page's appointment as Ambassador to Italy will interrupt his energetic work in behalf of good roads. Doctor Page has for several years been Chairman of the Membership Committee of the American Highway Association, and has brought into that well known organization nearly two thousand of America's foremost citizens. Filling the vacancy caused by Doctor Page's absence was one of the difficult tasks before the association at its meeting during the American Road Congress, which was held at Detroit throughout the week of September 29th.

* * *

Hundreds of motor cars from all parts of Mississippi were driven into Jackson at the recent good roads convention to take part in the good roads parade. Each town's delegation was kept together and indicated by placards. Clarksdale, Osyka and Meridian had the largest representations. Enroute to the capital the different touring parties reported that they were received enthusiastically at the small towns, where good roads speeches were made. This demonstration for better highways is expected to have a direct influence on the vote, soon to be taken in many counties, for increased funds for road improvement.

* * *

The Lake-to-River Road Association, founded in Milwaukee a year ago to mark a principal highway from Milwaukee, on Lake Michigan to two distinct points on the Mississippi river, both branches starting at Madison, the state capital, has completed the work on northwest route, which is from Milwaukee to St. Paul-Minneapolis by way of Madison and LaCrosse. The mark used is a St. George's cross in red on a white band around every fifth telephone pole in the country district and every other pole in cities and villages. The branch from Madison to Prairie du Chien is now being marked, and the Chicago-Milwaukee road will be next on the program.

* * *

"I am the hobo king, and who is more interested in good roads than the hoboes? I ask to be seated in this good roads congress as a delegate," shouted C. Jeff Davis, president of the International Itinerant Workers, as he pushed his way into the hall where the sessions of the American Road Congress were being held in Detroit.

And the convention did seat the hobo king, through its chairman, A. N. Johnson, state highway commissioner of Illinois.

"I just came in on the blind baggage from Indianapolis," explained Davis. "I am interested in good roads

as is every hobo. Now don't confuse hoboes with tramps. It's the tramps that disgrace our profession. Every since four years ago, when William Howard Taft, then president, gave me a letter of introduction to the Baltimore good roads congress, I have been crazy to be a delegate to one. There are 300,000 hoboes in this country and I have always thought we ought to be represented at road congresses."

* * *

The Davenport Automobile Club, of Davenport, Ia., has pledged itself to build 18 miles of road from the western borders of Scott county through Davenport, Mock Island, Moline and Watertown, if the Lincoln National Highway shall be routed through the tri-cities and has also assured the construction of a concrete highway for a distance of 55 miles from Watertown to Sterling via the Rock River Valley route. This is the largest project that has ever been undertaken by the Davenport Club.

* * *

Thomas A. Edison was asked recently as to what in his judgment would be the next greatest public development for the benefit of the people. Replying, he said: "Cement roads. I believe that in ten years cement roads will band the country from one end to the other to the exclusion of all other kinds."

* * *

Here is an interesting little news dispatch from Mayfield, Kentucky:

"This town will be very dull on October 15 and 16, according to indications. The committee appointed Monday night to get the names of people who will sign up to work and the merchants who will close their stores on these two days, report that already about 800 citizens have promised to join the band of workmen, while every merchant in the city will close up for two days. One drug store will remain open and the grocery stores will open from 6 to 8 in the evening. Everybody most will be out in the country working the roads."

When it is remembered that Mayfield's population is less than 6,000 this is something to be proud of. What other city of 6,000 people can boast of 800 road volunteers?

Coming Good Roads Meetings.

October 22-23—Southern Appalachian Good Roads Association, Asheville, N. C.

H. B. Varner, secretary, Lexington, N. C.

Nov. 5-6—Georgia-Carolina Good Roads Congress, Augusta, Ga.

Secretary, J. C. Harper, Augusta, Ga.

Nov. 10-15—United States Good Roads Association, St. Louis, Mo.

Secretary, J. A. Rountree, Birmingham, Ala.

Nov. 20-22—Alabama Good Roads Association, Mobile, Ala.

Secretary, J. A. Rountree, Birmingham, Ala.

Dec. 9-12—American Road Builders' Association, Philadelphia, Pa.

Secretary, E. L. Powers, 150 Nassau street, New York, N. Y.

The town of Mexia, Texas, will start street improvement with the proceeds of a bond issue of \$20,000 voted last month.

Alligator township of Chesterfield county, South Carolina, has issued bonds for \$40,000 for road-building.

GOOD ROADS NOTES

GATHERED HERE *and* THERE

Alabama.

Every effort possible is being put forth to make the Seventeenth Annual Session of the Alabama Good Roads Association, which meets in Mobile on November 20-22 the greatest meeting in the history of the association. Invitations have been sent to the 67 probate judges in Alabama inviting them to attend and to appoint 25 delegates from their respective counties. 100 invitations have been sent out to the mayors in Alabama asking them to attend and to appoint 15 delegates from their respective towns and cities to attend the convention. Invitations have been sent to 25 towns and cities that are near Mobile in the following states: Louisiana, Mississippi, Florida and Tennessee asking the mayors of those towns to attend and to appoint 15 delegates. These invitations have been sent out by the association, which has been joined by the mayor of Mobile, as well as the Chamber of Commerce, in urging that the invitations be accepted. The governors of five southern states above named have been requested to appoint 100 representative citizens to attend the convention. Secretary J. A. Rountree is in receipt of a letter from Governor Hall of Louisiana and Governor Brewer of Mississippi, both sending a list of 100 delegates from their respective states and stating that they have written each one of them personal letters to attend this convention. Invitations have gone forward to the Farmers' Union, Alabama Rural Letter Carriers and the Alabama Convict Improvement Association asking each of these organizations to appoint 100 delegates from their respective organizations. Already the last named association has appointed delegates. All automobile clubs, farmers' unions and good roads organizations in the state are expected to send delegates. Reduced railroad rates have been secured over all the roads in Alabama and within 100 miles of Mobile out of the state. Some of the most distinguished speakers and good roads advocates in the United States have accepted invitations to address the convention. Mobile is making a strong effort to secure as many delegates as they possibly can for the convention. The delegates will be royally treated on this occasion. Every one interested in good roads is invited to attend this great gathering at Mobile.

* * *

Arkansas.

Good Roads Day of the Interstate Fair to be held at Fort Smith, Ark., promises to be something more than demonstration of materials and an effort to further increase the good roads agitation in that section.

According to present plans an organization will be formed to insist upon the federal government complying with the terms of its compact with Arkansas upon its admission into the union, to appropriate one-twentieth of all money received from the sale of public land within the state for a national highway through the state. W. H. Harvey, president of the Ozark Trail association, Governor Hays and members of the Fort Smith Good Roads association will be the inaugurators of the proposed movement.

It will be for this purpose that the meeting of Good Roads days at the fair will be held. At that time, it is more than probable that following organization, resolutions will be adopted similar to the resolutions adopted

by the Missouri Old Trails Road association. These resolutions in part say: "That the congress of the United States be and is hereby requested and petitioned that said compact of union be executed and carried out in letter and in spirit by the general government, and to the end that an appropriation be made sufficiently large from the general revenues not otherwise appropriated to repair and rebuild wherever necessary the old Cumberland road, etc., etc."

In Arkansas, it is the suggested plan that the road might run from north to south. However, that would be a development of the negotiations after the federal government has been persuaded to perform the specific terms of its compact of union upon Arkansas' entrance into the sisterhood.

Fort Smith good road boosters are exerting every effort to assemble in Fort Smith on good roads day, the most prominent men of Arkansas and surrounding states. It is intended to get together a body of officials and others influential in state and national affairs in the hope of making the resolutions adopted to be of sufficient importance to compel the attention of the federal congress when brought to its attention.

* * *

Georgia.

"The date for the Georgia-Carolina Good Roads congress has been changed from November 10 and 11 to November 5 and 6," said Commissioner Watson, of South Carolina, president of the congress, when he returned to his home in Columbia recently from the Georgia city after a conference with other officials. He said that the date had been changed because it was in conflict with the meeting of the United States Good Roads association, to be held at St. Louis.

"The officials in Augusta are arranging the details and working out the programme," said Commissioner Watson, "and the congress gives promises of being one of the most successful ever held in South Carolina or Georgia. Only men who are directly concerned with the construction of good roads will be invited to the congress."

"Senator John H. Bankhead of Alabama will be invited because he is chairman of the postroads committee of the senate. Hoke Smith of Georgia will be invited not because he is a member of the senate from Georgia, but because he is also a member of the postroads committee. Congressmen Byrnes and Lever will be invited because they are members of the roads committee of the house. Geo. C. Diehl, president of the American Automobile association, will attend. All other highway associations will have officials at the Augusta conference. N. M. Parrott of Baltimore, secretary of the Quebec-Miami Highway association, has accepted an invitation to attend the congress in Augusta. The indications are for a large attendance."

* * *

Kentucky.

Governor McCreary, of Kentucky, at the request of the Kentucky Good Roads Association, has issued a proclamation setting aside October 24 and 25 as Good Roads Days and he calls on all loyal Kentuckians to get out and do valiant service for the cause of road betterment on those days.

Senator Huffaker, of Louisville, is credited by the

Louisville Times with being the first man to suggest to Governor McCreary the advisability of issuing a good roads proclamation. He was followed by the Kentucky Good Roads Association, which, at the annual meeting Sept. 17, unanimously adopted a resolution and appointed a committee to wait on the governor to urge the setting apart of certain days for this purpose. In acceding to these requests the governor is following the example of the governors of Missouri, Arkansas and Alabama. It is confidently expected that the people of Kentucky will do as good work on their roads as the people of the three states named have done.

* * *

Illinois.

On their honor, and without stripes or anything else to distinguish them from free laborers, forty convicts from the Illinois state penitentiary are at work on a public road near Dixon, Ill. They are given a large freedom, which none has yet attempted to misuse. The men are happy and sing at their work.

This is the first time convicts have ever been put on their honor east of Colorado. In the latter state the system has been tried with great success. The present Illinois experiment is being watched with great interest, and if successful doubtless will be tried out in other states.

* * *

Mississippi.

The people of a string of Mississippi counties from the Tennessee line south to Louisiana, are deeply interested in the movement to build a highway running by way of Jackson, Greenwood and other towns. It is now being urged that the different counties along the proposed route send one or two representative citizens to attend a conference which will be held prior to the next session of the legislature at Jackson, for the purpose of framing a suitable bill to be passed by that body to carry into effect the building of the highway with convict labor. It has been suggested that a highway commission be appointed, consisting of the superintendent of the penitentiary, commissioner of agriculture and one representative citizen from each county through which the proposed highway is to be run. It is also proposed that each county pay its pro rata share of the cost of maintaining the convicts while at work on the road. This is a wise suggestion and each county interested will take action at an early date relative to the carrying out of this or some other feasible plan.

* * *

Missouri.

A press dispatch from Jefferson City says:

"State Highway Commissioner F. W. Buffum has approved the county seat roads reported to him from sixty-one counties of the state and has apportioned money for the first quarter under the road dragging law at the rate of \$15 per mile. The law requires that the county court appoint a county highway board of three members who shall designate and report the mileage of roads from the county seat to the county seats of all adjoining counties subject to the approval of the state highway commissioner. If there are gravel or macadam roads in any such approved routes, the county is entitled to this road dragging money for improvements and repairs of such roads.

"Lieutenant-Governor Painter, who is performing the duties of governor, and who drafted the bill for the road dragging law, says the measure lays the foundation for a permanent road system in Missouri.

"From the reports received the mileage of the county seats roads is placed at 11,780 which, it is estimated, is about 1-10 of the state road mileage."

Nebraska.

Business men, farmers and the people generally were urged by Governor Morehead to work the roads October 9 and 10. He issued a proclamation dedicating these two days to road making. He says there is no more important factor in the up-building of a state than the development and maintenance of a suitable system of highways. His proclamation is, in part, as follows:

"History shows us that advance in civilization, wealth, and culture has kept pace with the means of travel and no country can continue to advance without taking heed of the means of communication and providing for the transportation of the public and of the public necessities.

"There is no more important factor in the up-building of a state, than the development and maintenance of a suitable system of highways. Nebraska has done much during her short history, but there is much yet to be done. Congress very wisely provided that each section line may be set aside for public roads, and our legislature from time to time, has made provision for the opening of other roads where necessary. Much money has been expended and much work done in making these thoroughfares suitable for travel; but in the rush incident to the opening and development of a new state, there has not been as much money expended and work done upon these highways as the welfare of the public demands. I am glad, however, to see an awakening of public interest in the betterment of our highways, and in this respect, Nebraska ought not to be behind her sister states.

"Now therefore, in order to further stimulate the interest in road building and to show by our acts that we are in earnest in our advocacy of improved highways, I recommend that October 9 and October 10, 1913, be set aside and dedicated to the work of road building."

* * *

North Carolina.

The Asheville-Charlotte Highway will soon be a reality, according to Dr. Joseph Hyde Pratt, state geologist. Dr. Pratt was in Asheville recently and in an interview published in the Asheville Citizen he stated that by the beginning of the next summer season the Queen City and the metropolis of the Land of the Sky will be connected by a highway which will offer a pleasant trip for motor travel. Dr. Pratt said that fifty-two convicts are in camp at Bat Cave, furnishing a working force of forty-four on the Hickory Nut Gap road. The convicts are working from Bat Cave towards the Rutherford county line and already one mile of the proposed highway has been graded, although it is not yet completed. As far as is practicable, the road is being made twenty-four feet wide and the force in charge of the construction is building a road which will be a credit to the state, Dr. Pratt says.

With the exception of the stretch of road which is being constructed by the state, there are but three incomplete links of the highways between Asheville and Charlotte. Rutherford county's portion of the highway has not yet been improved, and there are two township highways in Cleveland county, which must be improved before the road is ready for all-the-year round travel. However, Rutherford has sold bonds, the proceeds of which will be used in the completion of that county's link, and the Cleveland township people have issued bonds for good roads work, the commissioners having decided to spend a portion of the money on the building of Cleveland's part of the road. In Buncombe county there is a stretch of highway which is

not in condition for travel, although road forces are at work on it now and Asheville good roads enthusiasts hope that the commissioners will keep the force employed on the link from Fairview to Hickory Nut gap.

The Hickory Nut Gap road is the first to be built by state convicts and the news that rapid progress is being made will be learned with pleasurable interest by the automobilists of the cities which will be affected, as well as farmers along the line of the highway, whose property values will be enhanced as a result of the construction of the road.

* * *

Tennessee.

Governor Hooper, of Tennessee, will not join with the other chief executives of the southern states in issuing good roads proclamations and he gives his reasons therefor in the following message to the state legislature:

"To the Honorable Members of the House—I herewith return house joint resolution No. 4 without my signature for the following reasons:

"Said resolution recites the fact that the governors of several other states have set aside certain days for volunteer work on the public roads, and asks that the governor of Tennessee do the like.

"Nearly three years ago, just before I entered office, I led the movement for the construction of the Bristol-Memphis Highway. I proposed then exactly what your honorable body now suggests, namely, volunteer road

work from one end of the state to the other on said proposed highway. This idea was antagonized and ridiculed by the press and politicians opposed to me, until it was apparent that satisfactory co-operation of all elements of the people could not be secured. Patriotism, state pride and good roads enthusiasm were submerged in a cess-pool of poison partisanship. I, therefore, dropped this idea, and the friends of the Bristol-to-Memphis Highway have worked along other lines until the completion of this road within the next two years is now practically assured.

"In the meantime I have co-operated with every man or organization that has had a practical good roads scheme for the benefit of every section of the state. The progress of road improvement in Tennessee for the last two years has been phenomenal.

"I might be pardoned for suggesting, also, that by the time the publicity and organization work necessary for a state-wide road working could be done, the road working season would be over."

* * *

New York.

According to announcement from the office of John N. Carlisle, state highway commissioner, at Albany, the chain of state roads from New York to Buffalo should be completed by the close of 1914. The uncompleted portions of the 'cross-state trunk line are near Poughkeepsie, in Westchester county, near Balatine Bridge and in Chemung county.

When various roads, now under construction or con-



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templated, are ready, good roads will run north into the Adirondacks and the Canadian frontier and across the state. It is expected that state route No. 30, running from Niagara Falls east through Orleans, Monroe, Ontario, Wayne, Cayuga and Oswego counties will be ready next year.

* * *

Texas.

The 1913 edition of "Industrial Texas" issued by the Texas Commercial Secretaries Association, which is just off the press, has this to say about road work in the "Lone Star State:"

According to the latest report of the Federal Department of Agriculture, Office of Public Roads, Texas has 140,000 miles of public highways, or one-half mile of highway to every square mile of territory. The average for continental United States is three-fourths of a mile of road to every square mile of area. We spend \$2 per capita annually for improving and building good roads in Texas and the average per capita expenditure in the United States is \$1.55. We have 4,652 miles of public highways surfaced with stone, gravel or similar materials and now in good condition; there is a large percentage of our roads surfaced with clay or dirt and well drained. During the past three years we have spent \$7,500,000 annually on our public highways. Of this amount, \$4,000,000 was raised by issuing bonds and \$3,500,000 by regular road tax. We spend approximately \$53.60 per mile per annum on our public highways. The public roads of Texas will reach around the world five times and the area they occupy is equal to that of the state of Delaware. Four per cent of the Texas highways are improved and the United States average is 9 per cent.

Governor Colquitt, following in the footsteps of the governors of half a dozen other states, has issued a good roads proclamation, fixing November 5 and 6 as good roads days in the Lone Star State. His appeal has met with quick response from the newspapers of the state, big and little, and it is generally believed that the enormous success of the two good roads days of Missouri, the most successful to date, will be duplicated in Texas. Governor Colquitt's proclamation follows:

"Whereas, An adequate system of improved public roads is one of the great needs of our state, and good roads lend powerful aid to everything good in modern life, while bad roads form an obstacle in the path of progress. Recognizing this fact, the people of Texas have taken hold of this problem with tremendous interest, and it is now one of the foremost economic questions confronting our people and much good work has been done throughout the state in the past few years in the way of improving our public highways.

"Now, therefore realizing the necessity for a system of work along this line, and in conformity with my sense of duty in this matter, I hereby designate Nov. 5 and 6, 1913, as Good Road Days and call upon the people in every county and section of the state to make preparations for working the roads on those days and have meetings to discuss ways and means in the future for building good roads in the various localities throughout the state generally."

* * *

West Virginia.

In Governor Hatfield West Virginia seems to have a governor who is deeply interested in the growth and development of his state. He is a good roads advocate of the best type and gives promise of doing great things

along this line for his state. In a statement given out last month he said:

"The good roads laws that were passed at the last session of the legislature are now being compiled by Judge Lively, of the Attorney-General's office. The State Road Engineer is organizing this new department at the university. I am looking forward to the co-operation of all good citizens in a good roads campaign which will mark the beginning of the development of a road system in West Virginia based on economic principles with the assurance of material future accomplishments for our state and its citizens.

"In a discussion of the idea of the National Road proposition with Senator Silver recently a very practical proposition was suggested which will mean a great deal to our state if we can be assured of sufficient support and co-operation to accomplish the scheme, which is in every way a practical and feasible one.

"The suggestion is that we try to induce the federal government to adopt as its route for a national turnpike, the present Virginia thoroughfare, which connects Winchester, Woodstock, Harrisburg, Staunton and Lexington with the eastern turnpikes. This would be a practical economic route for the National Government to adopt. Beginning with the Virginia Turnpike the road would then extend by way of Lexington, White Sulphur, Lewisburg, Charleston, Huntington thence on through Kentucky by way of Lincoln's old home, and also near the childhood home of Jefferson Davis, and on south. This route, if adopted by the national government, would give to the people a road connecting the north with the south, and the east with the west, extending through the most picturesque country in the world, as well as through the most important historic section of our country. This road would directly connect tourists with all important watering places in Virginia and West Virginia, and also with all the historic battlefields of the civil war, including Gettysburg.

"It is my intention to appoint Senator Silver as West Virginia's national representative in the matter of the national highway project. I shall join with him in visiting the governor of Kentucky and Virginia with the hope of being able to interest those two state executives in this important project.

"I am very much interested in the future development of our roads. I spent a great deal of time after the close of the campaign last November in preparing bills for the attention of the legislature which would give to the people substantial assistance and support at the least financial consideration in the different sections of our state."

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC.

of Southern Good Roads published monthly at Lexington, N. C., required by the Act of August 24, 1912.

Editor, H. B. Varner, Lexington, N. C.

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Fred O. Sink, Lexington, N. C.

G. W. Johnson, Greensboro,

FRED O. SINK, Business Manager.

Sworn to and subscribed before me this 2nd day of Oct. 1913.

W. H. MENDENHALL, Notary Public.

GOOD ROADS NOTES IN BRIEF

Galveston county, Texas, has voted \$250,000 of bonds for additional road improvement.

In Trinity county, Texas, Precinct No. 2 has voted \$100,000 of bonds for road building.

Road District No. 2 of Copiah county, Mississippi, has voted bonds for \$75,000 for building roads.

In Montgomery county, Texas, Road District No. 2 voted bonds for \$250,000 for road-building, which was quickly followed by District No. 3 with a bond issue of the same amount. Montgomery is coming out of the mud.

Road District No. 2 Iberville parish, Louisiana, has voted bonds for \$46,000 for road building.

In Halifax county, North Carolina, Enfield township is to hold an election on the 21st of October to vote on a bond issue of \$60,000 for building 75 to 100 miles of gravel roads.

Mt. Vernon district of Fairfax county, Virginia, votes next month on a bond issue for roads of \$90,000.

Jonesboro, Tennessee, will hold an election to decide on a bond issue of \$50,000 for street improvement.

The city of Baltimore contracted last month for street paving amounting to nearly \$75,000.

Montgomery county has awarded contracts for road work amounting to \$100,000.

Miami, Florida, has contracted for \$85,000 worth of up-to-date paving.

Marshall county, Alabama, is asking for bids on grading and draining 17 miles of road.

Lake Charles, Louisiana, will construct 80,000 square yards of pavement.

Harnett county, North Carolina, has available for road work \$14,000.

Montgomery and Bath counties, Kentucky, will construct a road 12 miles long to cost about \$32,000.

The Board of State Engineers, of Louisiana, are asking for bids on nine miles of main public highway.

Caddo parish, Louisiana, will contract for 25 miles of improved highways. This parish has available for road work about \$150,000 per year from a five mill tax levy.

Holmes county, Florida, has voted bonds for \$40,000 for road work.

Valdosta, one of the best towns of "Wiregrass" Georgia, has issued \$35,000 of bonds for street paving.

Yazoo county, Mississippi, will issue \$77,500 on good roads bonds.

Kenton county, Kentucky, will vote soon on a bond issue of \$100,000 for road building.

Lake county, Florida, is conducting a campaign for a road bond issue of \$500,000.

Mr. W. S. Keller, state highway engineer of Alabama, let a contract last month for the construction of a state-aid road at Scottsboro to cost \$8,000.

Contracts were let at St. Louis the first of this month for \$57,743 of street paving.

Waycross, Georgia, will pave Gilmore street with brick at a cost of \$30,000.

Blacksburg district of Montgomery county Virginia; is planning a bond issue campaign. It is proposed to build a system of roads in the district to cost \$100,000.

The commissioners of Orange county, Florida, are contemplating the calling of an election to vote on a bond issue of \$600,000, of which \$500,000 is to be spent on brick roads and \$100,000 on sand clay roads.

The Fifth Road District of Matagorda county, Texas, has voted bonds for \$60,000 for road-building.

Madison county, Mississippi, will build roads with the proceeds of a bond issue of \$100,000 voted last month.

Nueces county, Texas, voted bonds for \$165,000 for road-building.

Road District No. 2, Polk county, Texas, voted bonds for \$40,000 for road-building.

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BRIDGES & CULVERTS

The commissioners of the District of Columbia will let contracts for seven bridges across Rock Creek in the outskirts of Washington to cost \$275,000.

The commissioners of Surry county, North Carolina have contracted for two steel bridges across the Yadkin River.

Brazoria county, Texas, has contracted for a steel bridge across Brazos river at Velasco to cost \$60,000.

Fort Worth, Texas, will bridge West Fork creek at a cost of \$29,000.

Anderson and Cherokee counties, Texas, will build a bridge across Nueces river in connection with a county highway soon to be constructed.

The city of Waco, Texas, is considering an election to vote bonds for a number of much-needed bridges.

Highland county, Virginia, is preparing to build a number of costly bridges.

Work is about completed on the bridge across the Monongahela river at Catawba, West Virginia. The bridge, when complete, will have cost \$800,000.

The board of revenue of Jefferson county, Alabama, will build four concrete bridges.

Tallapoosa county, Alabama, will bridge Tallapoosa river at Dadeville.

The new bridge to be built across the Arkansas river at Fort Smith, Arkansas, will cost \$500,000.

Escambia county, Florida, will spend \$100,000 in building a bridge across Escambia river.

The town of St. Andrews, Florida, will build three bridges.

The city of Baltimore will spent \$86,750 on the superstructure of a bridge across Gunpowder river.

The commissioners of Beaufort county, North Carolina, have contracted for the building of a bridge recently destroyed by a storm, at \$3,200.

Davie and Forsyth counties, North Carolina, will proceed at once to build a steel bridge across the Yadkin river at a cost of \$25,000.

The bridge connecting New Bern and Bridgeton, North Carolina, destroyed by the storms last month, will be rebuilt at once. The bridge is one mile long.

London county, Virginia, is asking for bids on two costly bridges.

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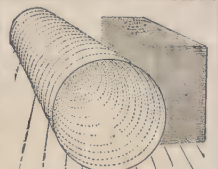
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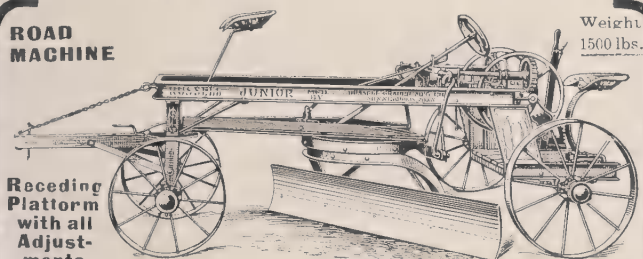
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Through its Land and Industrial Department and its Department of Farm Improvement Work it co-operates with the communities along its lines for the location of industries and of desirable classes of Farm Settlers and employs expert agents to co-operate with farmers seeking their advice as to improved farm methods, including diversification of crops, the building up of soil productivity, live stock raising and dairying. It has awarded scholarships in the State Agricultural Colleges of the States traversed by its lines to young men who would otherwise have been unable to avail themselves of an agricultural education. Realizing that the farmer who takes up the growing of new crops or the raising of live stock may be discouraged in his first season by the failure to market his products satisfactorily the Company has appointed market agents to give such information relative to markets, methods of packing, shipping, etc., as may be helpful to producers seeking their co-operation.

All of the co-operative development work of the Southern Railway Company is free to all persons in the territory traversed by its lines who may wish to avail themselves of it.

On matters relating to Southern development, or farm and factory openings, call on or address

M. V. RICHARDS
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On 2,615 Miles of Road

Since the introduction of Trinidad Liquid Asphalt two years ago the output of this material sold and shipped has been sufficient for the surface treatment of 2,615 miles of roadway.

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It is preferred because the results obtained with it are permanently good. Trinidad Liquid Asphalt has the stability of the Lake asphalt, with which it is closely related.

It does not "bleed" and disappear in the form of greasy dust. It stays in the road and builds up a lasting asphaltic surface.

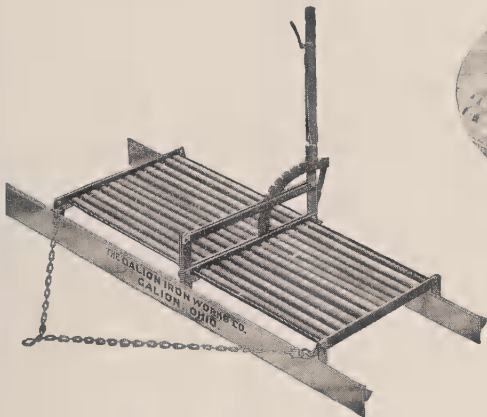
The disagreeable defects of oiled roads are mainly due to paraffine---a grease. Trinidad Liquid Asphalt contains no paraffine.

Applied hot or cold, it is a permanent constructive agent---not a temporary dust layer.

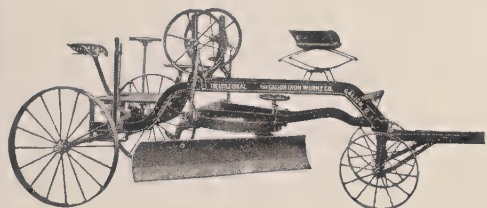
Trinidad Liquid Asphalt booklets are interesting to engineers, contractors and taxpayers. Ask also for new illustrated booklet, "The Wonderland of Trinidad."

ROAD DEPARTMENT

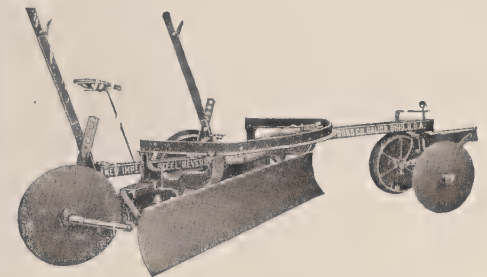
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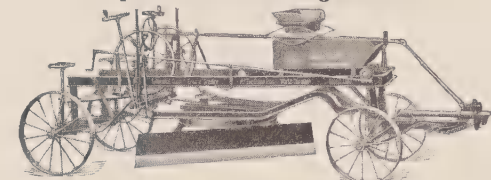
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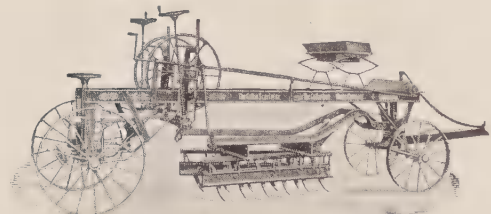
Only a small part of our large line is shown here. A handsomely illustrated catalog, showing our entire line, mailed on request.



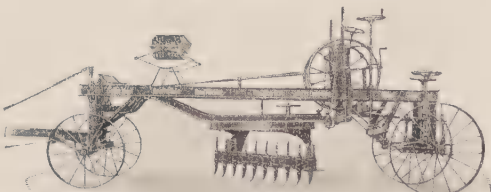
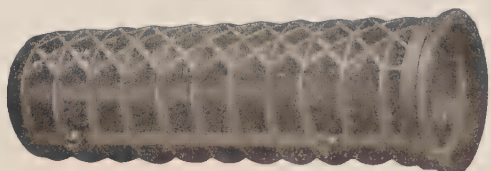
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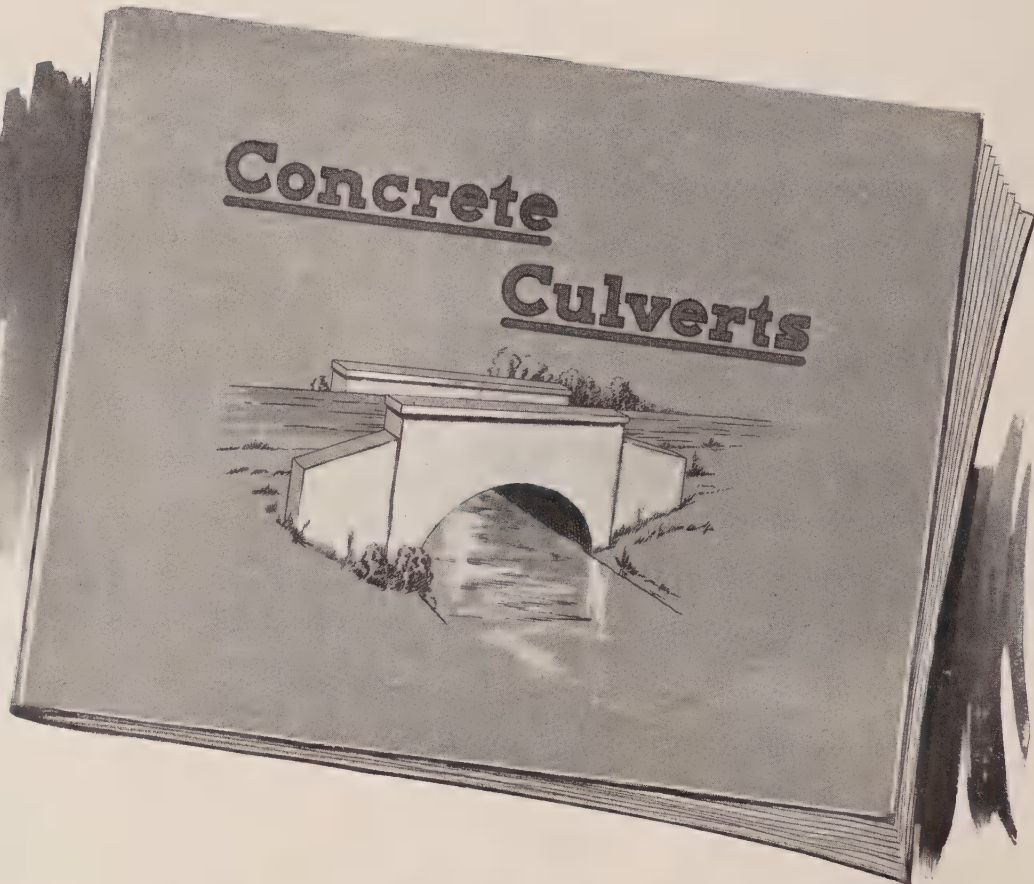
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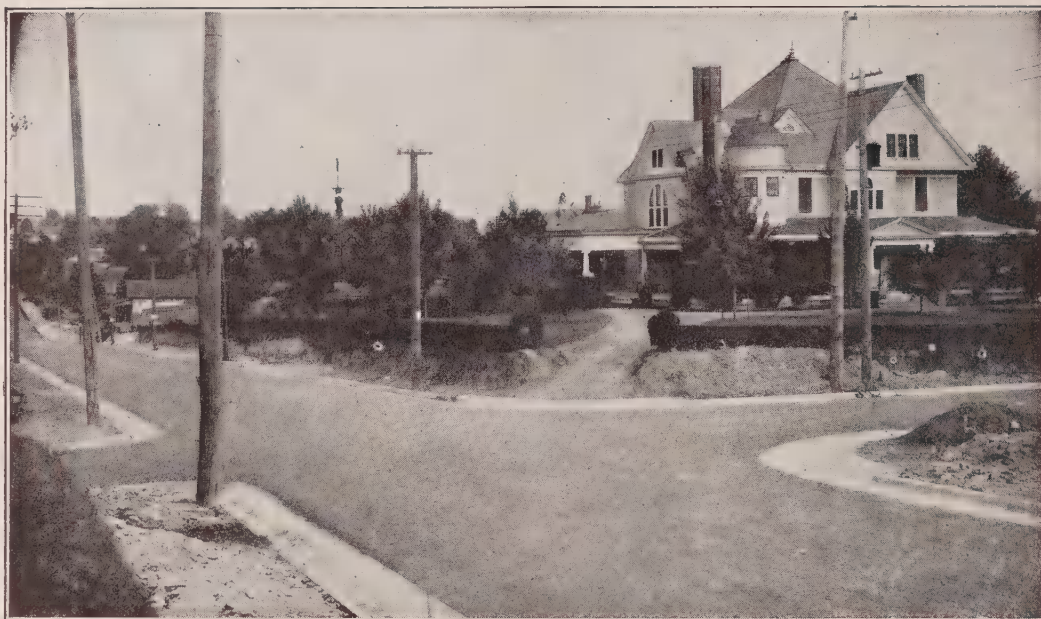
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These products are absolutely pure, containing 99 per cent. bitumen, and can be manufactured to any consistency desired. The three grades "A," "B" and "C" will be found to solve all problems of road surfacing or road construction that are ordinarily met with.

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CASE Gas Tractor Pulling Two CASE-Perfection Graders. Note the Extensible Rear Axle

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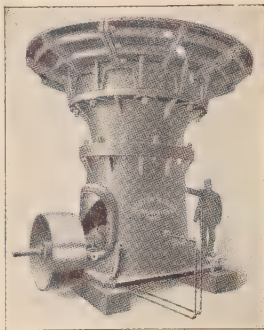
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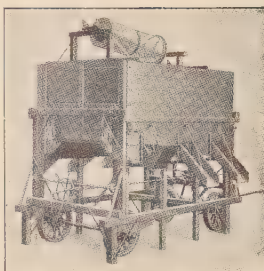
**Stone Screens
Stone Bins, etc.**



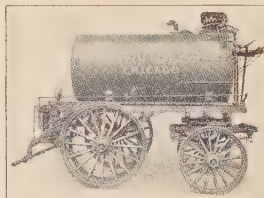
Austin Gyrary Crusher



Aurora Rock Crusher



Aurora Bins and Screens



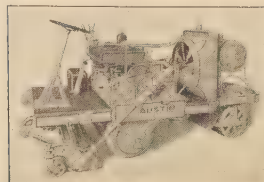
Austin Road Oiler



Austin Sprinkler



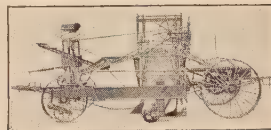
Austin Sweeper



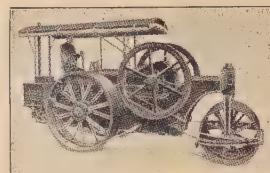
Austin Motor Mower



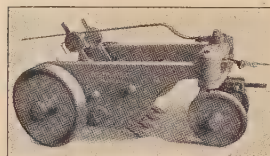
Giant Grader



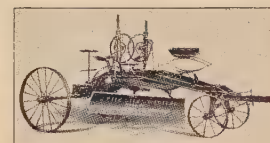
Elevating Grader



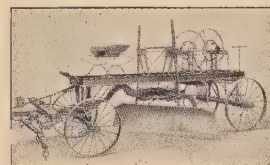
Austin Motor Roller



Austin Scarifier



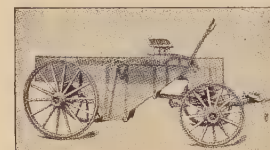
Little Western Grader



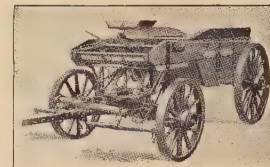
Western Grader



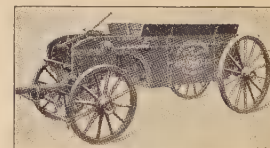
Austin Grader



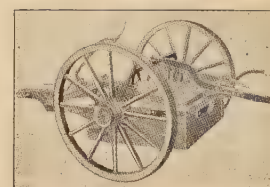
Austin Stone Spreader



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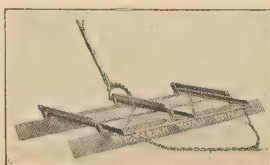
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Road Drag



Drag Scraper

American Road Builders' Association, Philadelphia, Pa., Dec. 9-12, 1913

SOUTHERN & GOOD ROADS

A MONTHLY MAGAZINE DEVOTED TO HIGHWAY AND STREET IMPROVEMENT

Vol. VIII. No. 5.

Lexington, N. C., November, 1913

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Typical Scene on the National Pike, Four Miles West of Frostburg, Maryland

PUBLISHED BY

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For macadam, dirt and gravel roads, Aztec Liquid Asphalt provides the best and most efficient surface treatment. It is a pure, natural maltha possessing the necessary constituents to cause it to penetrate thoroughly the surface of a roadway. Upon evaporation there is left a hard asphaltic binder, which gives the road the appearance of a sheet asphalt pavement.

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Cement Clay Gravel is a natural road material taken from the hills of Harnett County, at Lillington, North Carolina.

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*Preserves Roads
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Tarvia in Ben Avon

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Then the automobiles came and so did the dust.

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In 1909 Watt Avenue was constructed with "Tarvia X" and is in perfect condition. The Borough now paves all of its new streets with "Tarvia X" and uses "Tarvia A" for the maintenance of its old macadam surfaces.

A steady policy has been pursued of using "Tarvia A" as fast as possible on the old water-

bound surfaces with the result that a large part of the road area in Ben Avon is now in excellent shape.

Mr. C. D. Dyer, President of the Borough Council, states:

"I cannot express too strongly my recommendation of Barrett products for finishing streets for the use to which they are devoted in a Borough like Ben Avon.

Tarvia is a special coal tar compound which is used as a binder to form a tough, plastic, waterproof matrix around the stone in a macadam road, preventing attrition by automobile traffic and erosion by water.

There are three grades of Tarvia:—"Tarvia X" for road and pavement construction and resurfacing; "Tarvia A" for road maintenance; and "Tarvia B" for dust suppression and road preservation.

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Lexington, N. C., November, 1913

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Relation of State to Highway Improvement

By HON. W. W. FINLEY

President of Southern Railway Company

NATION, state and county each has a proper relation to the improvement of the country highways. I shall direct my brief remarks today more especially to "The Relation of the State to Highway Improvement."

Good country highways are so essential to the highest development of prosperity, especially in agricultural communities, that, in my opinion, the improvement of these highways in any state so directly concerns all of the people that the state government may properly share in the work of road improvement. Generally speaking, the county is the unit in all matters of road construction and maintenance. Participation in the work by the state need not necessarily disarrange this system. On the contrary, some of the states which are expending considerable sums annually on their country highways apportion the money among the counties which are required to make contributions, bearing a fixed relation to the amount of state aid extended. The character and extent of state aid will depend, in large measure, upon circumstances. The best results may be attained where a direct appropriation of state funds for road construction can be made. The apportionment of this among the counties on the basis of a fixed ratio to county expenditures will stimulate the raising of funds for road improvement in each county.

Whether direct appropriations for road work may be made by the state or not, there is a wide field for state usefulness in connection with highway improvement. There should be, I believe, in every state, a highway commission charged with the general duty of promoting the improvement of the country highways throughout the state. Competent supervision is essential to the best results either in road construction or maintenance. If all of the money that has been spent on the country highways of our states had been wisely expended and if all of the work that has been done had been most intelligently applied, we should have a much better system of highways than at present. At this time, when there is a widespread and constantly growing appreciation of the benefits of good roads, we should profit by the mistakes of the past. All work should be planned and carried out under the supervision of skilled highway engineers. I think that, wherever it is practicable, each county should employ a competent road engineer, under whose direction all of the work done on all of the roads in the county should

be carried on. For planning and supervising the construction of a macadam road or any other type of highly improved highway, the services of such an engineer are essential to securing the best results. I believe, however, that he may also render valuable service to the county in directing and supervising the improvement and maintenance of those roads which are not immediately to be highly improved. In all of this work the county engineer should keep in touch with the State Highway Commission and its engineers, and should have the benefit of their advice and co-operation. In counties of limited resources the expense of the employment of a competent engineer might be such as to use up an unduly large proportion of the money available for road work and the amount of work to be done might not be sufficient to take up all of his time. In situations such as this the engineers of the State Highway Commission might, under some suitable financial arrangement with the counties, directly take charge of planning and supervising road construction and maintenance. By having all of the working gangs in charge of efficient foremen a single state engineer would probably be able efficiently to supervise the work in a group of such counties.

A State Highway Commission, with its co-operative engineering forces, could also be highly useful in the collection of information as to the different types of roads being constructed in all parts of the United States and in foreign countries and thus be prepared to advise as to the type best suited for each locality, taking into account the character of traffic to be hauled on the road, the money to be expended, and the road building materials available.

Questions sometimes arise as to the most advantageous use that may be made of convict labor. With due deference to the views of others, I have no hesitation in expressing my opinion that the best use that can be made of such labor is in the construction and maintenance of the country highways of the state. When employed in this way convicts do not come into competition with free labor engaged in skilled occupations, and I can conceive of no work which can be done by them which will directly benefit so many people of the state. The state highway commission should, I believe, be charged with the duty of apportioning convict labor among the counties and with the general supervision of such labor.

Under the constitutional power to establish post

*An address delivered at Southern Appalachian Good Roads Convention. Asheville, N. C., October 22-23.

offices and post roads congress has already, in an experimental way, entered upon the policy of extending federal aid to the improvement of country highways used by rural mail carriers, and it is not improbable that in the near future some comprehensive plan of federal aid may be adopted. This will bring about an important relation of the state to road improvement. Whatever may be our individual views as to the wisdom or unwisdom of federal aid, there can, I think, be no question that, if such aid shall be extended, it is desirable that it shall be in such form as to be most beneficial to the people who use the country highways. It will manifestly be impracticable for the federal government to deal with each county. The consideration that has been given to this subject in congress points to the adoption of some systematic way of appropriating among the states so that the federal government will deal with each state relative to the selection of the roads within that state to be improved, supervision of the work and the controlling of expenditures. The method adopted will, of course, be prescribed in such legislation as congress may enact. I believe, however, that federal appropriations should be apportioned among the states on an equitable basis, in arriving at which not only area, present population and road mileage, but also the potential possibilities of states, should be considered.

In the selection of the post roads to be improved by federal aid and in the character of the improvements to be made, some federal authority will necessarily have a voice. I believe, however, that the selection of these

roads should primarily rest with the state. There should, I think, be no insurmountable difficulty in the evolution of a system by which state and nation would work together harmoniously. The interests of each are, I think, substantially identical. Generally speaking, the roads which are most used by the people of a community are those radiating from a market town or shipping station, and these are the roads which the state would naturally be most interested in having improved. The improvement of these radiating roads from different centers to connecting points, would ultimately cover the state with a network of through highways. Market towns and shipping stations are generally important postal points from which rural free delivery routes radiate, and the federal government is, therefore, likewise interested in the improvement of these radiating roads. If a system of federal aid shall be inaugurated it will be necessary for each state to have some organized machinery for co-operating with the federal government. In the State Highway Commission such machinery would be provided.

I am glad to have the opportunity of being with you today and of noting the great interest in highway improvement in the southeastern states manifested by the attendance at this annual meeting of the Southern Appalachian Good Roads Association. It indicates that the people of our section are alive to the importance of improved country highways and that the work will not be allowed to lag until farmers everywhere in the southeast have the great benefits that will come from improved highways to market.



Along the French Broad River, near Asheville, North Carolina

Some Impressions of the American Road Congress

By DR. JOSEPH HYDE PRATT

ONE of the most successful road congresses or conventions ever held in the United States was in session in Detroit September 29th to October 3. Although the Congress was in session five and a half days, yet even this time was too short for a full and free discussion of the many valuable papers on various road problems that were presented at the congress. There has perhaps never been such a large representation of road engineers, builders, contractors, and enthusiasts gathered together as at this congress.

Equal in value to the excellent papers and discussions on the various road problems presented at the various sessions, was the most complete and instructive exhibit of road machinery and surfacing materials. The manufacturers had utilized the space assigned them to the very best advantage, and it was possible for an engineer or contractor to examine at close hand practically any road machine that he would have need of in his road work. Surfacing materials were also well presented by the manufacturers, and it was possible to study at close range the materials themselves and see object lessons of where the material had been used.

It was not an uncommon thing to hear delegates expressing themselves as being well paid for attending the congress. In fact, no matter what phase of road work one might be especially interested in, it was touched upon in one way or another and the information desired was obtainable. Over 40 states had accredited delegates at the congress, and Canada sent delegates from several Provinces. Altogether there were at least 2,500 delegates in attendance.

The sentiment and attitude of a congress such as this on the various road problems and other questions that were brought up for discussion, is expressed in the resolutions adopted by such a congress. The American Road Congress passed resolutions that are well worth analyzing; and a copy of these resolutions is given below:

Resolutions Passed by the American Road Congress.

Resolved, that the American Road Congress earnestly favors the creation of a National Department of Public Roads directed by a secretary, who shall be a member of the president's cabinet.

Resolved, that the American Road Congress favors State Highway Commissions and state aid for the construction and maintenance of the main roads of the several states.

Resolved, that the American Road Congress favors the establishment of a National Road System, and the construction by the states, counties, and towns of the lateral and connecting market highways.

Resolved, that the American Road Congress respectfully requests the congress of the United States to authorize the president to appoint a commission from civil life, and make sufficient appropriation to enable it to make a thorough and exhaustive report on and recommend a system of federal aid.

Resolved, that the American Road Congress respectfully petitions the congress of the United States to adopt the necessary legislation, so that the United States may hereafter be officially represented at the International Road Congresses.

Resolved, that the American Road Congress favors

the investigation by the U. S. Office of Public Roads of applications for patents affecting road and bridge construction before Letters Patent are issued.

Resolved, that the American Road Congress commends the Lincoln Highway Association for its efforts in seeking the establishment by popular subscription of a transcontinental highway as an enduring and useful memorial to Abraham Lincoln, and further commends the National Old Trails Association for its splendid work in the rebuilding of the Cumberland Road and the Santa Fe Trail.

Resolved, that the American Road Congress emphatically endorses the compulsory use of wide tires and the road drag.

Resolved, that the American Road Congress favors, wherever practicable, the use of convicts in road construction and maintenance.

Resolved, that the American Road Congress favors long tenure in office of experienced and efficient highway officials.

Resolved, that the American Road Congress expresses its sincere thanks and appreciation to the citizens and commercial organizations and the press of the City of Detroit, of the county of Wayne, and of the state of Michigan, for their hearty co-operation and generous hospitality towards this, the greatest of American Road Congresses.

As expressed by the first resolution, the American Road Congress is very much in favor of a Department of Public Roads, the Secretary of which shall be a member of the president's cabinet. This has been considered by previous road congresses and other large congresses held in the United States, and the opinion is becoming crystalized that economy and efficiency of all construction work that is now being carried on by the federal government in several departments can be best effected if this is all done in a single department of public roads.

Although the congress favors legislation providing for the establishment of a National System of Highways yet, as there are many ideas and suggestions being offered relative to federal co-operation in road construction and maintenance, many of which are now before congress in the form of road bills, the American Road Congress passed the resolution asking congress to authorize the president of the United States to appoint a commission from civil life who would be given a sufficient appropriation to enable it to make a thorough and exhaustive report on the question of the federal government co-operating with the states in obtaining good roads and recommend to the president some plan by which the co-operation can be effected. If this can be done, there is no doubt but that the federal government will be kept from making expenditures for federal aid in road work which will not give the results desired and that the investigation will result in a definite plan that can be carried out effectively and to the satisfaction of the country as a whole.

Another broad resolution passed by the congress, and one that should be headed, is that relating to state highway commissioners or boards that place the supervision of the construction and maintenance of the roads of a state under state engineers. It is impossible to ob-

tain the best results in road work in a state when the township or the county is the unit and the state has no supervision or authority over the work done.

One resolution relates almost entirely to the maintenance of our roads, and, if the suggestion in this resolution can be carried out, that the states pass compulsory laws in regard to the use of wide tires and road drags on the public roads, it would be the means of decreasing very greatly the cost of maintenance of many of our roads. This suggestion should receive very serious consideration by Road Highway Commissions and road officials, and it is earnestly to be hoped that the question will be studied in each state as to how far this suggestion can be put into practical shape.

The question of convict labor, which has been so universally discussed throughout the country, was considered by the American Road Congress, and it was practically the unanimous opinion of the congress that convict labor should be used wherever practicable in building public roads.

Road legislation was another subject to which considerable attention was given by the congress, with the result that a committee was appointed to consider legislation relating to roads and to report back to the next congress what universal road legislation they considered advisable for the different states to adopt.

In discussing the question of the next meeting place

for the congress, it seemed to be the sense of the congress that the 1914 meeting should be held in the south, and the 1915 congress in the far west. Several of the states had representatives attending the congress with invitations for the next meeting, and the last session of the congress was given over largely to these delegates, who presented the claims of their respective cities for the convention. The cities inviting the congress for 1914 were Atlanta, Denver, New Orleans and Peoria; those inviting the congress for the 1915 session were Spokane, Los Angeles, and San Francisco.

The exhibitors of road machinery also considered the south as the most favorable sections of the country for holding the 1914 congress.

The Knoxville (Tenn.) Sentinel says that Dublin, Georgia, was treated lately to a sight never before seen since the world began. A farmer came to town with thirty bales of cotton piled on a single wagon. The cotton was sold for \$2100. This farmer has had a strong wagon built, with steel frame and roller bearing axles, and it took nine mules to haul the thirty bales of cotton. But, with the ordinary run of country roads, it would probably take four mules to pull six bales through mudholes. There must be some good roads near Dublin to stand a weight of 15,000 pounds in addition to the wagon.



Fine Macadam Road Four Miles Northwest of Tazewell C. H., Tazewell County, Virginia. This photograph was submitted in the prize contest by Mr. A. M. Black, of Tazewell, Va.

The Old National Pike

By MISS ALMA RITTENBERRY

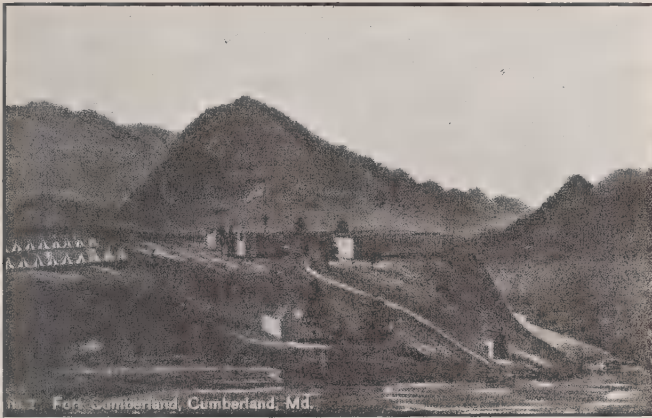
Chairman Jackson Memorial Highway Committee, Alabama Daughters of 1812

WHAT'S in a name'' is an oft repeated phrase. You would think there was a whole lot in the name of the old pike called by the people of Maryland "The Old Cumberland Pike," by the people of Pennsylvania, Ohio, Indiana and Missouri "The Old National Pike." Local tradition is powerful in influencing people to hold on to a name—strong as the laws of the Medes and Persians.

The old pike will be in part a portion of the great Lincoln Highway which will connect New York with

The national road as constructed by authority of congress begins at Cumberland, Md., and runs through Wheeling, W. Va., on to Dayton, Ohio, but the road between Cumberland and Baltimore, owned by individuals, was linked to it, and the two together constitute the national road. It was opened to public use in 1818, and until 1852, when the railroad was pushed west of the Alleghanies, it was the great highway of travel and trade between East and West. Col. Searight says, "As many as twenty four-horse coaches have been counted in line at one time on the road, and large broad-wheeled wagons, covered with white canvas stretched over bow laden with merchandise and drawn by six Conestoga horses, were visible all day long at every point, and many times until late in the evening, besides innumerable caravans of horses, mules, cattle, hogs and sheep. It looked more like the leading avenue of a great city than a road through rural districts.

"Ex-Senator Joseph Cannon, just before he was retired, spoke interestingly of the old National Pike which runs through a portion of Indiana. "Among my earliest recollections," said he, "is the stage coach with the four horses, the driver and the blowing of the horn to announce the arrival of the mail on the old national trail. The recollections of the boy, with the world before him, are to me, as I have no doubt they are to many old men, very pleasant. That road was never completed to St. Louis. It was never entirely completed in Indiana except as far as Richmond, though, if I recollect right, some bridges were built and sections of the road completed as far as Marshal and Greenup, Ill. Before it was completed, evil days came and the question arose as to the maintenance of the national road. Congress refused to maintain the road

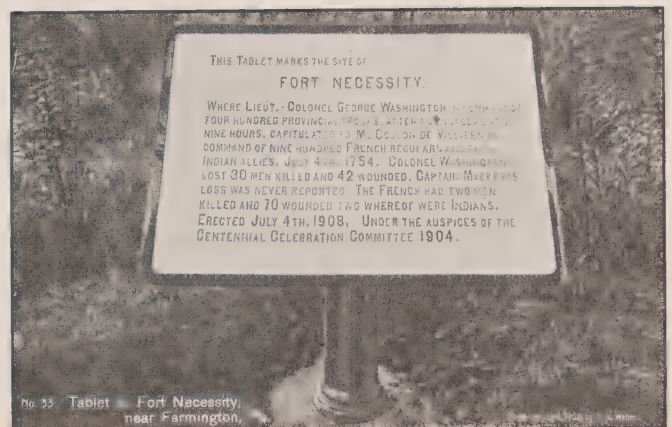


An Interesting Place on the Old National Pike

San Francisco, one of the eight national highways proposed by Senator Cullom of Illinois in a bill he presented to congress in June 1911, asking for an appropriation of one hundred and forty-eight million dollars to survey and build them. His bill was shelved, but the idea still prevails and will finally be worked out.

The history of the old Pike is interesting. Nearly a century old, it is still one of the most magnificent roadways in the world, and every foot of the picturesque course through mountains appeals powerfully to the sense of the romantic and picturesque in nature. That part of it which traverses Pennsylvania has been transferred by the national government to the state, and the latter has appropriated large sums of money for its improvement. Much of this has already been spent, and more will be liberally provided and expended in the future.

This famous road was the outgrowth of the pressing necessity a hundred years ago for better means of communication than then existed between the eastern and western section of the young republic. Its inception was in 1806 during President Jefferson's administration when a commission was appointed to lay it out, and congress first voted money to pay the expense. Tradition credits Henry Clay with the conception of the road, but in a speech in congress, January 27, 1829, Hon. Andrew Stewart declared that "Albert Gallatin was the first man that ever suggested the plan for making the Cumberland Road." Col. Z. B. Searight in his "History of 'The Old Pike'" says this declaration was never contradicted, and must be accepted as true. Nevertheless, Henry Clay's name is inscribed in tradition and history as the Father of National Roads, and he was the first to have a monument erected in his honor as such.



Where George Washington "Won His Spurs"

and the states would not maintain it, so, before a great while, it fell into innocuous desuetude so far as the United States government was concerned and was granted to the respective states.

The United States parted with all title to that improvement and it is now vested in the respective states. It is a dear old road to me, and if I had the power I would construct that road from Cumberland, Md. to St. Louis as it was originally surveyed and in part con-

structed. I would make that much of a contribution to ancient recollection and to present utility. I would make the road a great pattern for all roads and highway bridges for all the people to copy in constructing the 2,000,000 of miles of highway in the United States, and I will by voice and vote contribute to doing this."

The road was justly renowned for the great number and excellence of its inns, or taverns. On the moun-



A Tragic Spot on the National Pike

tain division, every mile had its tavern. Here one could be seen perched on an elevated site near the roadside, and there another sheltered behind a clump of trees, many of them with inviting seats for idlers and all with cheerful fronts toward the weary traveler. The sign boards were elevated upon high and heavy posts and their golden letters winking in the sun, ogled the wayfarer from the roadbed and gave promise of good cheer, while the big trough, overflowing with clear, fresh water and the ground below it sprinkled with droppings of fragrant peppermint lent a charm to the scene that was well nigh enchanting.

Along through Pennsylvania, through Uniontown, Connellsville and McKeesport, the National Pike is called "Braddock's Road." Braddock's Road was generally used for such transportation and travel as were required during the period following the French and Indian War until the National Pike put it out of business in 1812. It is a tradition that the first wagon load of goods, about 2,000 pounds, carried over the Braddock Road as far as the Monongahela River at Brownsville, was transported in 1789. This 140 mile journey between Hagerstown and Brownsville consumed a month.

The Braddock Road over the mountains is identical with Nemacolin's Path or trail. Nemacolin was a Delaware Indian Chief. His tribesmen and others followed this path in their travels North and South, and when the pioneer white man set his determined face toward the west, he saw and recognized the Path as a good thing, and adopted it. When the English soldiers passed over it in 1755, and enlarged it, they gave it the name of Braddock's Road. But Nemacolin is really entitled to the engineering skill that laid its course. Nemacolin was a sagacious, aggressive, observing, large-minded Red Skin.

Mountain roads and trails branch out endlessly in all directions from the old pike running along the crest for miles through the timber, every rod, inviting and picturesque, summons you to its leafy aisles, cool and inviting; to ferns in great luxuriance patches of flowers contributing dashes of color here and there, decaying trunks overgrown with ivy, trees bending beneath the affectionate weight of the wild grapevine, and best of

all, in splendid profusion along the rocky streams and deep within the green recesses of the forest, the mountain laurels bids you share liberally its great wealth of blossoms.

It is no imaginative creation of dreaming fancy, but an actual vision of enchanting earthly beauty that unrolls in scenic grandeur far, far away across the wooded waves of successive undulating ridges until dissolved in the distant blue-gray haze of the misty eastern sky. Over the verdured billows, up and down, down and up; through glade and glen, the famous Old National Pike rises and falls in rippling limestoned whiteness until it drops into the valley of the Potomac at Cumberland. It is an historic road. On it is old Fort Necessity, a rude stockade built by Washington in 1756, with Fort Duquesne near. Not far from the road by a pathway that is rough and tangled in the shadow of the cliff, is a heap of stones surmounted by a rough modern cross; that marks the grave of N. Conlon de Jumonville, the young French lieutenant who perished on that spot on the night of May 27, 1754 in an attack by a force of Virginia Militiamen and Indians under command of George Washington.

The bones of General Braddock lie in his grave beside the Pike. The grave is enclosed by a board fence, within which are a number of trees planted through the efforts of the late Josiah King, of the Pittsburgh Gazette.

On from Cumberland, skirting the Potomac by Harper's Ferry, with the Highway from Gettysburg joining the old Pike at Hagerstown on to Washington, could there be a more appropriate monument to Lincoln than a Lincoln Memorial Highway from New York to Wash-



National Pike 6 1-2 Miles From Frostburg, Where Work Stopped on the road. Need of Improvement Shown in This Picture

ington over the Old National Pike to the Middle West into the Pacific Slope? If congress does nothing else in the way of a public appropriation than to appropriate money to build a National Highway to Abraham Lincoln, it will have done well. More will follow.

State Highway Commissioner J. R. Marker of Ohio recently issued a statement in which he stated that during the past 17 months 222.16 miles of improved road, under the direction of the state highway department, had been awarded and 140.79 miles completed. Prior to that, from the inception of the department in 1904, contracts for only 198.57 miles were let and 107.03 miles completed.

Unsurfaced Roads

By **W. S. KELLER**

State Highway Engineer of Alabama

2,100,000 miles of roads in the United States are unsurfaced or rather have not been resurfaced by the hand of man. It would be difficult to ascertain the various soils or natural earths composing the wearing surface of unsurfaced roads. From the finest silt to the hardest granite these roads are composed of and the treatment of one will entirely differ from the treatment of the other.

Until within recent years it was considered next to impossible to make a good road of ordinary earth without surfacing with stone, gravel or other hard ma-

least resistance, removing trees and such rocks as would not permit the axles of wagons to clear, the pioneers of this country made it possible to travel, in a way, from place to place. We have many roads in Alabama now in use that were opened and traveled by General Andrew Jackson, both on his march to fight the British at New Orleans and the Indians in South Alabama and Florida. Of course, such roads were opened hurriedly and little or no attention was given to grades or alignments. Settlers taking advantage of work that had been done built their homes along these military roads or traces as they are frequently called. In the construction now of more modern roads, it is difficult to better the alignment of these roads on account of homes, churches and schools which have been built close to these highways. However, in many places, these roads have been and are being changed to meet the demand of traffic of today. The genuine bad roads of the south belong solely to this class. They cannot be maintained for the reason that they have never been constructed and the great amount of work necessary to keep them in passable condition disheartens the man who by law is compelled to work them. Until these roads are re-located, avoiding heavy grades and marshy bottoms, sharp angles and useless twists and graded so that they will have good drainage, we may expect them to be bad.

The second class of unsurfaced roads are the ordinary graded earth roads which have proper alignment, grade and drainage. The construction of an earth road is simple, but sometimes the simplicity of it causes the average county commissioner or supervisor to over-estimate his ability as a road builder. The proper construction of an earth road consists of:

First—A careful inspection by the proper official to determine what beneficial changes in grade and alignment can be made, taking into consideration initial cost and cost of maintenance. The center line and grade of the road should be established by an engineer. After the center line has been established and width of road bed agreed on and grade established, construction work can begin. The proper and efficient grading force for the work should consist of a foreman, eight or ten good two-horse teams with drivers, one wheel and one drag scraper for each team and one extra wheeler and drag for emergencies, one good railroad grading plow, one grading machine, one split-log drag, one dump man and one loader with five or six extra men for grubbing and other work. The foreman should be an experienced grading man who understands handling earth and knows when it is proper to use drag scrapers, wheel scrapers or wagons. The road should be so graded that the ditches or gutters are parallel with the center line of the road and uniform distance from it. When completed the road should be uniform in width and surface should be smooth and even, free from holes and high places with a uniform crown with a fall of one inch to one foot from center to gutters. On grades this ratio of fall should exceed that of the grade to such an extent that water will readily flow to the ditches instead of down the road. Drain pipe should be freely used and no water should be allowed to flow over the road if it can be avoided. In some cases it is not practical to build the road above high water. In such cases danger signs



MR. W. S. KELLER
State Highway Engineer of Alabama

terial. The absence of suitable material in vast sections of the country and the high cost of it when handled by railroads has forced attention to earth or unsurfaced roads. Unsurfaced roads may be divided into three classes:

First, the ordinary country road opened when this country was young, leading from one settlement to another or from a farmer's home to that of his nearest neighbor. These roads were not opened through any process of law, in fact, there was no law governing roads in those early days, but by following trails of

*An address delivered before the American Road Congress at Detroit, September 29-October 4.

should be posted showing at what stage the water becomes too high to ford the stream.

We have in the south nearly every kind of soil from sticky gumbo on the one hand to coarse sand on the other. The methods used for improvement of roads through a section of one will not do altogether for the other. The worst roads by far that we have in the south are in our rich and fertile prairie lands where, unfortunately, there is very little road building material to be found. This soil readily absorbs water and becomes very sticky after rains. It expands freely and dries rapidly when the sun shines and becomes very hard under the tamping effect of teams and vehicles. From observation and experience I have learned that these roads of all others require a very high crown and the driving surface should only be wide enough to allow two vehicles to pass. If a road is narrow with a fall of not less than one and one-half inches to the foot, water will shed rapidly to the ditches and the entire surface will dry out rapidly. A road of this kind can be constructed quickly and at little expense, except where grades are to be reduced or bottoms filled with a grading machine, or even with a split-log drag. The latter method will require more time, but in the end will be found to be very satisfactory. No earth road can be maintained in good condition unless it is so constructed as to drain well and unless it is kept free from ruts and holes.

The third class of unsurfaced road which we frequently have to deal with are those in sections of country where the soil or earth is really road building material, composed either of gravel, sand-clay or top soil so that when the road is graded it is, in fact, surfaced. Where this condition exists, splendid roads can be built at a minimum cost.

The maintenance of unsurfaced roads is radically different from the maintenance of surfaced roads. For

instance, the patrol system used on macadam roads would be entirely inadequate for earth roads. One man can keep up two or three miles of macadam road where he would unquestionably be unable to keep in good condition a like amount of unsurfaced road. With the use, however, of a team and drag, he would be able to keep in good condition twenty miles of ordinary graded earth road. Some very zealous advocates of the drag claim everything for it, from the removal of stumps and rocks to the ditching of roads. I am a great believer in the drag, but from experience, I know that obstructions must be removed and proper drainage provided for before it is effective. It has been difficult with the road men of the South to convince county authorities that this little machine is of value. The writer when in charge of road work in a Tennessee county inaugurated a system of dragging that proved very successful. Ten roads were graded a distance of three miles each. The grading was completed in November. With surface of these roads fresh and loose, it was a foregone conclusion that the winter rains would soften them to the extent that they would become impassable under heavy traffic. Contracts were made with a farmer on each of these roads to keep them dragged during the months of December, January, February and March and the price paid was 30c. an hour for a man and team. The county furnished the drags. As an inducement to the men to do good work, the county offered prizes of \$25, \$15 and \$10 for the best kept roads. Specifications for dragging and rules governing the contest were furnished each contestant. One important rule was that the prizes would be awarded to the men who kept their roads in the best condition at the least cost. In order that the engineer might keep in close touch with the work, postal report cards were furnished each man and they were required to fill them out every Monday showing the distance dragged, hours con-



A State Aid Road in Blount County, Alabama, Showing Change in Location. Old Road to Right is Fifteen Feet Below New Road

sumed and cost for the previous week and mail them to the office of the engineer. In this way it was practically impossible for a dishonest man to render an account for more time than he really consumed without it being detected or if he worked more than was necessary, the reports of the other contestants when compared with his disclosed it. On the other hand if one should be neglecting his work by not dragging sufficiently it was likewise detected. This thirty miles of road was kept in splendid condition despite the fact that two heavy snows fell during the four months. The most interesting fact connected with the contest was the road that was awarded first prize cost the county only \$15 or \$5 per mile.

In many southern states the roads are maintained or at least are supposed to be, by what is known as statute labor, which means a man subject to road tax may work out his tax under the direction of a beat or district overseer. Such labor is practically worthless and few men are required to work out the stipulated number of days. As it seems to be impossible to entirely abolish statute labor, the question that confronts us now is, what is the best system coupled with this labor to use in the maintenance of our roads. Good results have been accomplished in several counties in Alabama by putting the work in the hands of a few regularly

employed foremen who give all of their time and attention to the work, instead of leaving it to many beat overseers who work when it suits their convenience, or do not work at all when it suits them, as it usually does. These foremen are furnished with two or three teams with regular drivers, wagons, scrapers and grading machines, split-log drag and necessary small tools and as many Beats or Districts assigned to each as he can work. A census is taken in each foreman's territory at the first of the year of all men subject to road duty and he is furnished with a list of names and is required to work every man who has not paid the required amount of cash into the county treasury in lieu thereof. No foreman is allowed, under penalty of dismissal, to receive cash from work hands, but such hands as desire to pay must make their payments to the proper county official at the court house. This method has proven good in most cases, but as a general thing I do not think the best results can be accomplished by permitting men to work out their road tax.

In conclusion I desire to urge that in your efforts to better rural conditions by the construction of the main thoroughfares with hard surfacing material, that the branch roads and "side tracks" be not entirely overlooked.

Fourth American Good Roads Congress at Philadelphia, Dec. 9-12

Although the road building season for this year is rapidly drawing to a close, the subject of highway improvement still remains of vital interest to street and highway officials, contractors, engineers and others engaged in the work. The winter months offer the opportunity to review the work accomplished during the busy season, and to lay plans for the next year.

It is not surprising therefore that the announcement of the Fourth American Good Roads Congress, to be held at the First Regiment Armory in Philadelphia on December 9, 10, 11 and 12, in connection with the Tenth Annual Convention of the American Road Builders Association, should occasion widespread interest throughout not only Pennsylvania, but all the other states. The subject of highway construction and maintenance is coming to be recognized as one of the most vital importance.

Governor Tener of Pennsylvania has shown a great interest in this convention, and has sent invitations to the governors of every other state, and to the Lieutenant-Governors of the Canadian Provinces, to appoint three delegates to this convention. Delegates have already been appointed by the governors of the states of Illinois, Nebraska, Connecticut, Kentucky, Montana, Louisiana and South Carolina.

Highway engineers and contractors from all parts of the country have already signified their intention to be present at this meeting, and take part in the discussions.

The exposition of methods, materials and machinery to be held in connection with the congress will this year far surpass that of any previous year. Spacious as the First Regiment Armory is, the advance reservations of space for exhibits indicate that all the available space will be applied for long before the exhibition opens. The officials in charge are therefore planning to provide additional space beyond that already

laid out. Many of the machinery exhibits will consist of large units, such as traction engines, rollers, trucks, etc., which will be shown outside the exhibition hall. Much of this machinery will be exhibited in operation.

The exhibits will include everything entering into the construction of roadways, including machinery, appliances and materials. Sections of different kinds of roads will be shown, and the best methods of construction and maintenance fully explained. This feature will be of especial interest to highway officials, coming, as it does, after the busy season of roadway work, and while the plans for next year still remain to be determined.

An especially valuable and interesting part of this exposition feature will be the national, state and technical exhibits. As in former years, these exhibits, made by the government, the different states and leading technical schools and colleges will comprise models, materials, testing apparatus, maps, photographs, etc., illustrating the different state highway systems, and the progress which is being made in their development. At the Cincinnati convention last year, nineteen different exhibits of this class were shown. This year it is proposed to make this section more complete than ever before, and it is safe to say it will attract great interest.

An invitation is cordially extended to every highway engineer and contractor, irrespective of membership in the American Road Builders Association, to attend this meeting. It is confidently expected by the officials of the association that the response to this invitation will be so general that the Philadelphia congress will be the largest gathering of actual road builders that has ever been held anywhere.

Alexander county, North Carolina, will issue bonds for \$100,000 for road improvement.

Proceedings of Southern Appalachian Good Roads Convention, October 22-23

By MISS H. M. BERRY, Acting Secretary

THE Fifth Annual Convention of the Southern Appalachian Good Roads Association was called to order by the president on the morning of October 22nd, in the auditorium of the Langren Hotel, the session being opened by prayer by the Rev. Calvin Waller of the First Baptist church. There was a goodly number of delegates present at the opening session, and the convention opened under the most favorable auspices. The first address of welcome was made by Hon. Locke Craig, governor of North Carolina in behalf of the state.

After extending to the visitors a cordial welcome to the state, Governor Craig summarized the work now being done toward the building of good roads in the nation, in the south, and in the state, and what this work means to the country at large. He declared that the good roads work is one of the leading factors in the development of the civilization of the country, and pointed out the direct effect of this development in moral, intellectual, commercial and spiritual channels. "The general effect," he stated, "of getting good roads is to bring the people into closer touch with each other and the outside world and unite them in a common effort for community, state, and national progress."

The delegates were given a welcome to Buncombe county by Hon. N. A. Reynolds, chairman of the Board of County Commissioners; by Mayor J. E. Rankin, in behalf of the city of Asheville; by Hon. F. M. Weaver for the Asheville Board of Trade; and Hon. E. C. Chambers for the Asheville-Buncombe County Good Roads Association. All of these speakers extended to the visitors a cordial welcome and spoke briefly of the great work in road development, which has been accomplished through the work of this association.

Dr. Joseph Hyde Pratt, president of the association, responded to the addresses of welcome in a brief address, expressing appreciation on the part of the association for the cordial welcome extended to its members and delegates, and then reviewed briefly the objects of the association since its organization. He stated that he considered it most appropriate for the association to come back to the city in which it was organized to celebrate the climax of good roads building in the state. He stated that the organization has tried to push along the work in every way possible in this general Southern Appalachian region, and that the roads of the various states and sections are being built because the people have come to realize that they must have the roads in order to enjoy the fullest blessings of prosperity.

On behalf of Virginia, a response was made by the Hon. C. B. Scott of the Virginia Highway Commission. For West Virginia, Hon. A. D. Williams, Chief Road Engineer of that state, expressed the interest which that state is now developing in the good roads cause, and that now 600 county convicts are at work on the roads of his state, and that 1200 state convicts will be put on road work within a few weeks.

Following these responses was a report made by Mr. H. B. Varner, secretary of the association and Dr. Joseph Hyde Pratt, president-treasurer. The report of the treasurer was audited and found to be correct, and ordered to be filed in the minutes of the association.

The principal address of the morning was made by

Hon. W. W. Finley, president of the Southern Railway, who spoke on the "Relation of the State to Highway Improvement." He expressed the opinion that good country highways are so essential to the highest development and prosperity, especially of agricultural communities, that the state government may properly share in the work of road improvement, and that participation by the state need not necessarily disarrange the system under which the county is the unit in all matters of road construction and maintenance. He suggested that there should be in every state a highway commission charged with the general duty of promoting the improvement of county highways.

Following Mr. Finley's address, a general discussion on state aid in road work was led by Mr. Cyrus Kehr, of Tennessee, and it was the consensus of opinion that no systematic work can be accomplished for the state generally through the disconnected and desultory efforts of county officials without some general state engineering supervision, planning out roads connecting county with county, and one section with another; and working out the best roads which the various sections of the state can build to the best advantage.

It is felt by the association that this is probably the most important step which any state can take at the present time, as it will help to do away with the present unbusiness-like and unsatisfactory methods of road work now prevalent among the majority of the Southern Appalachian states.

The president then announced the appointment of the following committees:

NOMINATIONS AND NEXT MEETING PLACE.

Dr. C. P. Ambler, of North Carolina, Chairman; C. B. Scott, of Virginia; Cyrus Kehr, of Tennessee; E. F. Lipscomb, of South Carolina; J. S. Bosworth, of Kentucky; C. P. Light, of West Virginia; J. A. Smith, of Georgia.

RESOLUTIONS COMMITTEE.

C. A. Jones, of Virginia, Chairman; C. H. Neal, of North Carolina; J. D. Harris, of South Carolina; J. H. Smith, of Georgia; A. D. Williams, of West Virginia; James Maret, of Kentucky; Judge Lewis Shepherd, of Tennessee.

MEMBERSHIP COMMITTEE.

E. C. Chambers, of North Carolina, Chairman; M. F. Bryan, of South Carolina; Miss H. M. Berry, of North Carolina.

FINANCE COMMITTEE.

C. M. W. Rand, of South Carolina, Chairman; P. F. Patton, of North Carolina; H. E. Dorin, of Virginia.

The afternoon session was taken up with reports of road work in the Southern Appalachian States. Hon. C. B. Scott of Virginia, who represents the State Highway Commission of that state, declared that the prospects for successful road building in the Old Dominion are unusually encouraging. The state is doing much for the improvement of her roads, and a vast amount of money is being spent in a judicious manner.

Mr. A. D. Williams, of West Virginia, declared that the building of good roads has been the highest factor

in the development of the country. Mr. Williams presented statistics to show that the government spends about three-fourths of its income annually for the army, navy and pensions. Mr. Williams urged the construction of a Peace Lee-Lincoln Highway, traversing the states which participated in the civil war. Mr. Williams stated that all of the counties of West Virginia are alive to the benefits of good roads, and are beginning to solve some very difficult engineering problems in connection with their road construction.

A telegram from Hon. Robert C. Terrell, commissioner of public roads of Kentucky, was received expressing his regret at not being able to be present at the convention; but that the governor of Kentucky had proclaimed two Good Roads Days which would conflict with the dates of the convention.

Hon. R. J. Freeman, Commissioner of Roads and Revenues, wired his regrets at not being present, and stated that business engagements made it impossible for him to come to Asheville. He also stated that Georgia now has 500 convicts at work on her roads, and is leading all the southern states in highway construction.

The president called upon Mr. J. A. Smith chairman of the Highway Commission of Hall county, Georgia, to give an outline as to the methods which are being employed in that county; and Mr. Smith declared that Georgia has abandoned macadam, and is now building her roads of sand-clay and brick. He referred to the work which is being done with convicts in road construction, and the introduction of better methods of treatment of the convict.

Following the afternoon session the delegates to the convention were the guests of the local owners of au-

tomobiles, and were given a drive over the paved streets of the city and some of the splendid roads of Buncombe county.

That evening they were the guests of Grove Park Inn at an elegant banquet given in honor of the delegates to the convention. The dinner was featured by short impromptu speeches. President Pratt acted as toastmaster and called on various delegates for short talks as follows:

Mr. C. P. Light, of West Virginia, who is Field Secretary of the American Highways Association; Mr. A. G. Batchelder, chairman of the executive board of the American Automobile Association; Judge Lewis Shepherd of Tennessee; Hon. Jesse Taylor, Editor of "Better Roads," and President of the Ohio Good Roads Federation, and Governor Locke Craig.

Following the speech of Governor Craig, the delegates adopted a resolution thanking the management of the hotel for the spirit of hospitality shown in this elegant dinner. An amendment declaring that such hotels as Grove Park Inn are fitting terminals for a system of good roads, was adopted unanimously.

The morning session of the second day of the convention was opened with prayer by the Rev. Wyatt Brown of the Trinity Episcopal church, and the first address of the morning was delivered by Mr. E. K. Graham, acting president of the University of North Carolina on "The Relationship of Colleges and Universities to the Good Roads Movement." Mr. Graham's address was scholarly and forceful, and will be read with a great deal of interest. His address will be published in full in this magazine.

Following Mr. Graham's speech, Hon. A. G. Batchelder, Chairman of the executive board of the Ameri-



One of the Many Beautiful Curves on the Pisgah Forest Road, Near Asheville, N. C.

can Automobile Association, made a talk outlining the work of his organization and showing the relationship between the work of this association and the good roads movement, and the vital interest connecting the two.

The work of the American Highway Association was outlined by Hon. Charles P. Light, Field Secretary of the association, which was followed by an address delivered by Hon. Jesse Taylor, president of the Ohio Good Roads Federation and vice-president of the National Highways Association, who made a most stirring and effective talk in favor of National Highways and Good Roads Everywhere. He put in a plea for good roads starting somewhere and ending somewhere instead of broken links of good road beginning nowhere and ending nowhere. He showed that our government is spending immense sums of money for various public works benefitting certain sections of the country; but, up to the present time, has given little attention to the building and maintenance of National Highways, and the lending of encouragement toward the building and maintenance of country roads, which mean so much to every citizen in our country.

The afternoon session was convened at 2:30 o'clock, and the first number on the programme was an address by Governor Craig on "Good Roads Days." The governor stated that he expected every able-bodied man in the state to give his actual services in road work on November 5th and 6th, and expressed the belief that he would not be disappointed. He states that this belief is based on the fact that the state has been progressing rapidly within the past few years, and that the citizens now realize the importance of good roads, and the necessity for lending their co-operative efforts in securing them. The speaker declared that no man should feel himself above manual labor, and that he himself expected to work the roads during those two days.

In closing the governor made an appeal to the women of the state to lend their co-operation in making the observance of these days a success, and declared that if such co-operation were given success was assured.

At the conclusion of the governor's address, the convention heard reports on the work being done on special highways in the Southern Appalachian section. The first of these reports was submitted by Hon. H. B. Varner, chairman of the Central Highway of North Carolina. He had most favorable reports from all of the counties traversed by this highway, and stated that the building of this highway is doing much to arouse good roads enthusiasm along its entire route. He expressed the belief that it would be in good condition for travel by 1915. In connection with his report, Mr. Varner also referred to the use of convict labor in this state in connection with railroad work, and stated that the state loses over \$400 a day by letting state convicts to contractors for building railroads and for other such work. He made a plea for the use of state convicts in the building of public highways.

Dr. M. H. Fletcher reported the development on the Asheville-Charlotte Highway and spoke of the work now being done on a link of the highway known as the Hickory Nut Gap Road by the state convicts. He expects the road to be completed within a year. He believes that the completion of this road will mean a great deal to the entire state as well as to the section through which it passes.

Mr. James Maret, of Kentucky, reported that much interest has been aroused over the construction of the "Boone Way," although active work has not been be-

gun on the road. A complete report of the work on this highway will be given in this magazine.

Mr. Cyrus Kehr of Tennessee made a similar report concerning the Knoxville-Atlanta Highway, and also spoke with regard to the Knoxville-Bristol Highway.

President Pratt made a brief report on the Asheville-Greenville Highway, and stated that Greenville county, South Carolina, has changed the original route in that county whereby a steeper grade is provided than is desirable. He expressed the hope, however, that the commissioners could be brought to realize their mistake and revert to the original route.

Following this were the reports of the committees, the Resolutions Committee reporting as follows:

Resolutions.

Whereas: The Southern Appalachian Good Roads Association, being thoroughly convinced of the progress and uplift that will follow in the train of Good Roads Everywhere, and is deeply interested in this question as affecting the educational, material and social welfare of the people of the south; therefore,

Be it Resolved: That the Southern Appalachian Good Roads Association favors:

A system of National Highways built and maintained by the national government;

A system of state highways built and maintained by the states;

A system of county highways built and maintained by the counties.

Resolved, That this association place itself on record as favoring federal co-operation to states in obtaining systems of good roads and believe that the most favorable plan of such co-operation is by the federal government's constructing and maintaining a system of national highways.

Resolved: That the Southern Appalachian Good Roads Association in view of the many bills introduced in congress for the participation of the government in the building of roads and the failure of any of these bills to meet the approval of a majority of the members of congress, respectfully petitions the congress of the United States to authorize the president to appoint a commission from civil life with sufficient funds to make a thorough and exhaustive examination and recommend what action the government should take on this very important question.

Resolved, That this association believes that the logical place for holding the next American Road Congress is Atlanta, Ga. and we herewith urge the Executive Committee of the American Highway Association to consider favorably the holding of the next American Road Congress at Atlanta, Ga.

Resolved: That it is the sense of this association that the road work in any state can be best accomplished if the state has a State Highway Commission to supervise and direct the road work under competent road engineers.

Resolved: That this association declares itself in favor of working all able-bodied convicts on the public roads.

Resolved: That the association expresses its appreciation for the courtesies extended by the Asheville Board of Trade, the Asheville Merchant's Association, the Asheville-Buncombe County Good Roads Association, the Asheville Motor Club, the Management of the Langren Hotel, and the Greater Western North Carolina Association; and

Resolved: That a special vote of thanks be tendered to Manager Seeley of Grove Park Inn for the delightful and satisfying banquet at which the members of

the association were entertained Wednesday evening, October 22.

The next report was made by the committee on nominations and next meeting place, and the following nominations were put in order and unanimously elected:

Report of Committee on Nominations and Next Meeting Place.

For President and Treasurer—Joseph Hyde Pratt.

For Secretary—H. B. Varner.

For Vice-Presidents: Cyrus Kehr, Knoxville, Tenn.; Prof. C. M. Strahan, Athens, Ga.; E. C. Chambers, Asheville, N. C.; John Craft, Mobile, Ala.; James Maret, Mt. Vernon, Ky.; Edward F. Lipscomb, Gaffney, S. C.; Henry Roberts, Bristol, Va.; A. Dennis Williams, Morgantown, W. Va.

For Executive Committee: John A. Smith, Gainesville, Ga.; J. N. Fisher, Morristown, Tenn.; E. P. Wharton, Greensboro, N. C.; Charles P. Light, Martinsburg, W. Va.; P. St. J. Wilson, Richmond, Va.; Dr. C. P. Ambler, Asheville, N. C.; Robert C. Terrell, Frankfort, Ky.; W. T. Winn, Atlanta, Ga.; W. G. Serrine, Greenville, S. C.; W. S. Keller, Montgomery, Ala.; H. C. Elliott, Roanoke, Va.

Miss H. M. Berry was directed by a unanimous vote of the convention to cast the ballot for the convention. This committee recommended Bristol, Virginia-Tennessee, as the next meeting place for the convention.

The next report was from the membership committee as follows:

"It has been found that 11 states have been repre-

sented at this convention as follows: Virginia, West Virginia, Kentucky, Tennessee, North Carolina, South Carolina, Georgia, Ohio, New York, Indiana, Washington, and District of Columbia. 187 delegates registered and 141 paid membership fees."

Canadian Farmers to Build Permanent Roads.

The County Council of Essex County, Ontario, Canada, a distinctly rural community, has decided to submit a by-law on January 1 for one million dollars to be applied to the construction of concrete roads. Windsor, the county seat of Essex, has a few concrete streets, but the famous roads of Wayne county, Mich., are right across the river, and the farmers of Essex are thoroughly familiar with them. They have not only seen teams drawing tremendous loads with ease, but realize that these roads make excellent sidewalks as well as general traffic highways, a phase of the subject that appeals tremendously, as it means absence of mud and dust throughout the year. For these reasons Essex county farmers will make an appropriation proportionate to some of the very largest state appropriations now under consideration in this country.

Eight counties were represented at the good roads meeting recently held at Stamford, Texas. The meeting resulted in a highway association being formed. The purpose of the new organization is to build a road for return travel of the tourists from the Colorado-to-the-Gulf Highway.



A Fine Sand-Clay Road in Wake County, North Carolina, built under the supervision of Mr. W. L. Wiggs



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Official Organ of the North Carolina Good Roads Association

HENRY B. VARNER, President, Lexington, N. C.
DR. JOSEPH HYDE PRATT, Secretary, Chapel Hill, N. C.

Official Organ Southern Appalachian Good Roads Association

DR. JOSEPH HYDE PRATT, President, Chapel Hill, N. C.
HENRY B. VARNER, Secretary, Lexington, N. C.

Official Organ of the South Carolina Good Roads Association

F. H. HYATT, President, Columbia, S. C.
FINGAL C. BLACK, Secretary, Columbia, S. C.

Official Organ of the Virginia Road Builders' Association

C. B. SCOTT, President, Lynchburg, Va.
C. L. SCOTT, JR., Secretary, Harrisonburg, Va.

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No. 5.

BATTLESHIPS vs. ROADS.

Agitation in congress for new battleships and other fighting equipment is generally followed these days by a howl somewhere down the line from a good roads man, who sees in the outlay for man-killing, property-destroying machinery, absolute waste of money.

We acknowledge that the howler has our sympathy, though we would not go far enough to say that battleships are unnecessary in these days. Our nation must keep up with the procession, whether it wants to or not, and in the present scheme of things, battleships are necessities.

Right now the program of the jingoists calls for three battleships of the super-dreadnaught type. Good roads advocates are pointing out the fact that the price of one of these great engines of destruction would build 500 miles of road of the very highest type. The life of the average battleship is ten years and then it goes to the junk heap, while properly constructed roads, intelligently cared for, will last many years longer.

When congress meets next winter there is going to be a great fight for federal aid in road-building. The jingoists are going to be there, demanding some \$30,000,000 for three new battle ships, and there is but

little doubt that the battleship program will go through. The federal aid advocates may get some sort of definite action but it is extremely doubtful.

And the failure of the good roads people to get results is going to be due, mainly, to the fact that they have not agreed on a plan of assault. The jingoists have. The makers of arms and equipment and munitions of war, the steel trust, and all of the great interests that profit from the building of battleships, are fighting shoulder to shoulder, with a definite plan in view. The advocates of federal aid have almost as many different plans for federal aid as there are advocates of it.

These plans range all the way from Representative Shackleford's pork barrel plan, one of the most pernicious schemes ever devised, to the great system of national highways proposed by the National Highways Association. Some of the suggested plans are good. Many are wholly bad.

When the advocates of federal aid get together and agree on some definite plan and work together toward the realization of that plan, then, and not till then, will they be able to hold their own with the jingoists.

Uncle Sam is able to build battleships and roads, too, and he will start the work of road-building just as soon as some wise, conservative plan can be agreed on.

A NORTH AND SOUTH HIGHWAY.

The Manufacturers' Record suggests the building of a great highway running north and south, traversing the states in which the great battles of the Civil War were fought, with a branch line running into the north west and connecting at some point with the Lincoln National Highway, which is now assured.

The Lincoln Highway is to be of the highest type of construction. Primarily it will be a road for tourists and it will be used by thousands of automobilists every year. It will cross the continent, running from New York to San Francisco. The north and south highway, according to the plans of the Manufacturers Record and the organizations that are supporting it, would be of similar construction and in addition to its value as a road for tourists, it would have a wonderful sentimental value. Driving straight through the land where brother fought brother from '61 to '65, the road would be emblematic of a re-united country.

Mr. Henry B. Joy, president of the Lincoln Highway Association, heartily commends the plan and suggests that the highway be named the "Robert E. Lee Highway." He would have it connect with the Lincoln Highway at Gettysburg.

The suggestion is one to stir the blood of every patriotic southern man. It would be a magnificent tribute to the memory of the greatest soldier the world has produced in a century. Meeting the Lincoln Highway at Gettysburg where was fought the battle that settled the fate of the Southern Confederacy and determined for all time that the union of states is to be preserved, this highway would link together two of the greatest names in the history of our nation.

Who's Who in Highwaydom

"Gentlemen, a toast to Sam Hill!" There was a moment's confusion as more than a hundred representative citizens of the state of Oregon arose to their feet to respond. Then some one with a gift of song started "For He's A Jolly Good Fellow," and Sam Hill's eyes twinkled and his jolly face lit up with genuine happiness. The "Testimonial Dinner" was a "Sam Hill" banquet arranged by business men who wished to present the "Father of good roads in America" with a loving-cup as an earnest that his labor to create a definite and productive sentiment favorable



HON. SAMUEL W. HILL

to better built highways had not been unnoticed and unappreciated.

Tucked away somewhere in Mr. Hill's belongings, the ink still wet upon the paper, was a copy of Senate Concurrent Resolution No. 13, of the Twenty-Seventh Legislative Assembly of the state of Oregon, which tenders a vote of thanks to a private citizen of Oregon, namely Samuel Hill, "For a pleasant and profitable time as his guests and for the royal manner in which they had been entertained" et cetera, and which winds up with "a testimonial of the appreciation of this legislative Assembly of the unselfish work that is being done by Mr. Hill in the cause of good roads."

Sam Hill had a right to smile indulgently and to feel a bit gratified, for seldom does a man in the public eye receive a unanimous vote of approval for his good works. The banqueters bestowed upon him the title "Oregon's Friend." It might well have been broadened to "The Nation's Friend."

Senate Concurrent Resolution No. 13 is a reminder of the unique entertainment of a state's assembly by a man with an unselfish interest to exploit. It perpetuates a lesson to lawmakers in road-building. The Oregon legislature was in session in February last. At the fall election the people, confused by a multiplicity of good-roads measure, defeated all of them. The state was sadly in need of legislation that would permit the levying of necessary taxes for highway improvement. The people, after the election, realized their mistake and hoped for favorable legislative ac-

tion. The good-roads enthusiasts were downcast. But not so Samuel Hill, chief exponent of good roads. Never for one moment after the decisive defeat of the good-roads measures at the fall election did he lay down. He merely shrugged his shoulders and remarked "that they were confused." There was much wrangling over proposed measures in the legislative body. Mr. Hill feared that the outcome would be but another set-back to the cause. He determined to impress every lawmaker with the advantages of honestly built highways. He invited the entire assembly to be his guests for one day.

Eighty-eight gathered at the office of the Home Telephone Company in Portland, and from there took train for Maryhill, across the Columbia and up state in Washington to Klickitat county. The train was chartered by Mr. Hill. His favorite chef was given carte blanche to fill the buffet car, and the chef asked for no further orders. He took the instructions literally. The guests included state senators, representatives, prominent citizens of Oregon and Washington, and newspaper men. Governor Ernest Lister of Washington was present in person and Governor West of Oregon was represented by George F. Rodgers of Salem. Along the route Mr. Hill pointed out what he considers the world's blue-ribbon scenery, and here and there the work of road gangs on stretches of the Columbia river highway. At Maryhill Mr. Hill talked and talked and proudly displayed his seven varieties of highways, constructed at a personal expenditure of over \$100,000, from Maryhill to the Columbia river, demonstration highways built to satisfy a whim and to prove the value of an enthusiast's deductions. Oregon's lawmakers were convinced. The state now has one of the most effective good roads acts of any state in the union.

Mr. Hill is one of the highest authorities in the United States on the subject of permanent road construction. It has been more than a hobby with him. It is an obsession. For years he has been traveling here, there and everywhere, studying highway construction, figuring out high transportation taxes voluntarily assumed by farmers. He has crossed the seas several times to continue his studies in England and Germany and France. He goes about over the states of Oregon and Washington lecturing on his favorite study. He drops into a city or hamlet, engages a hall, makes no admission charge and talks for an hour and a half, illustrating his lecture with splendid stereopticon views of good and bad roads from Illwahee to Timbuctoo, from Maryland to London and Berlin, and incidentally, quite incidentally, brings in a series of beautiful slides showing the grandeur of scenery in the Oregon Cascades. It is a lecture that is not only inspirational but effective. He seldom leaves an audience unconvinced of the value of well-built highways.

Who is Sam Hill? Even though the facts were abbreviated to intensive terseness, it required a whole page of the menu prepared for the testimonial dinner, first referred to, to tell about Sam Hill. He was born in North Carolina, in 1857, and he has been so busy since that he has never had time to rest. He is a graduate of Haverford and Harvard. He has been president, associate counsel, general manager or director of a half-dozen railroads. He is president of the Home Telephone Company in Portland, and now as a side issue is amalgamating the independent telephone companies throughout the United States. He is president of the Maryhill Land Company, Maryhill, Washington; President of the United States Trust Company of Seattle, Washington; President of the American Road Builders' Association; Honorary Life President of the

Washington Good Roads Association; Vice-president of the Pacific Highway Association; Vice-President of the Columbia River Highway Association; Vice-president of the Inter-national Road Congress; Member of the Canadian Highway Association and an active member of over a dozen social clubs from New York city to Portland.

Sam Hill is a busy man.

He has another hobby aside from good roads, although related to that very laudable subject. For some years he has had made in Berlin, each year, a globe, similar to those found in all well regulated libraries, but embodying some special line of study. One is devoted to earthquakes; another to tidal waves; another to roads, good and bad; another to railroads. These globes he has had prepared by experts and then, not wishing to hide them under a bushel, has presented them to friends or institutions where they will serve as valuable reference works. One such may be found in the Congressional Library. Others have been presented to railroad presidents; still others to social clubs. Among the fortunate possessors of these globes are George Baker, Henry Cannon and the estate of the late J. P. Morgan, New York.

The latest effective gift was that to the state of Oregon of a comprehensive outline for a series of highways for the state. This plan, based upon information secured at a personal expenditure of \$10,000 and a thorough canvass of the state, is given to the people as a suggested means of development and a donation to the cause of good roads. Mr. Hill worked quietly for months, traveling over the proposed routes, studying their feasibility from standpoints of topography, people to be served and traffic to be encouraged. He had in mind the desirability of the most direct connection between rural regions and markets and between centers of population, and was influenced by the experience of the districts where good roads had already been built. He reaches this succinct conclusion—that the directest road which serves the most interests the longest distance is the best.

One of the happily chosen tributes to Samuel Hill's work is that by ex-United States Senator Charles W. Fulton: "Samuel Hill is doing more than any other one man for the good of Oregon. He is making it possible for people to get acquainted with each other. He is making it possible for tourists to see our scenic attractions."

What a lot of good could be accomplished if more men of aggressiveness and wealth and great constructive ability should give as unstintingly and as generously of their time to some especial phase of national cause of good roads!—C. E. Fisher in *Sunset Pacific Magazine*.

That a macadam road is a good investment is demonstrated by one of the farmers residing about half way between Baraboo and Kilbourn, Wisconsin. He usually grows about five acres of potatoes, and markets about 656 bushels each year. Before the road was built it took him eighteen days to market his crop. Now he can haul double the amount of the load, cutting the time of marketing in two, and also its cost. He pays \$1 a day for a man and a team, making the cost \$36 instead of \$72 as before. His road tax has been increased \$9 a year for ten years, making in all \$90. If he continues to save \$36 a year on potatoes alone his saving is about 400 per cent.

On November 18 Lake county, Florida, will vote on a road bond issue of \$500,000.

GOOD ROADS NOTES IN BRIEF

The commissioners of Bexar county, Texas, have ordered a bond election in their county on November 12th. The amount to be voted on is \$1,000,000, and will be expended as follows: For good roads, \$550,000; for new poor house \$50,000; for a county hospital \$125,000; for concrete bridges \$200,000 and \$75,000 for additions to the courthouse.

Petitions are being circulated calling for a good roads bond election in Justice Precinct No. 1 of Hill county, Texas. The amount to be voted on is \$250,000.

Delegates from five counties were present at the good roads meeting recently held at Galveston, Texas, which resulted in the "Dallas-to-Gulf-Airline Association" being formed. The purpose of the organization is to construct a 60 foot highway from Dallas to the gulf. A party began the logging of the proposed route October 15th.

The tax payers of Kingsville, Texas, recently voted an \$86,000 bond issue. Of this amount, \$52,000 will be used in installing a sewer system, and the remaining \$34,000 for street improvements.

The Runnels County, Texas, Automobile and Good Roads Club was organized at Ballinger last month at a meeting of a number of good roads enthusiasts and automobile owners. The purpose of the club is to employ an expert road builder and an engineer and to advocate an election for the issuance of \$225,000 worth of road bonds.

Enfield township, in Halifax county, North Carolina, has voted bonds for \$60,000 to build 75 miles of sand clay road.

Garza county, Texas, has voted bonds for \$50,000 for road work.

Gordon county, Georgia, will vote this month on a bond issue of \$150,000 for road building.

The town of Tarpon Springs, Florida, will vote on the 19th of this month on a bond issue of \$30,000 for street improvement.

The city of Baltimore, Maryland, awarded last month contracts for street paving amounting to \$132,000.

The town of Commerce, Georgia, has contracted for cement sidewalks on five miles of streets.

The city of Dallas, Texas, awarded last month contracts for \$250,000 of street improvement.

Marshall, Texas, has contracted for twelve blocks of asphalt macadam.

Opelousas, Louisiana, has awarded contracts for 60,000 yards of paving.

Americus, Georgia, will pave 1½ miles of street with creosoted wood blocks.

Plant City, Florida, will close bids on the 18th of this month for 24,320 square yards of vitrified brick paving and other street work.

Sanretown township, Stokes county, North Carolina, is asking for bids on grading and sand-claying 15 miles of roads.

Jackson county, Texas, has voted \$60,000 of bonds for road work.

Jones county, Mississippi, has authorized the issuance of \$50,000 of bonds for road work.

The commissioners of Montgomery county, Arkansas, have appropriated \$10,000 to build a bridge across the Ouachita river.

The commissioners of White county, Arkansas, have set aside a fund of \$12,000 for bridge building.

Rockingham county, North Carolina, is contemplating a bond issue of \$10,000 to build a bridge across Dan river.

OFFICERS

C. B. Scott, President
Lynchburg, Va.

Wm. F. Cocke, V-Pres.
Richmond, Va.

C. L. Scott, Jr., Secretary
Waynesboro, Va.

W. I. Lee, Treasurer
Tazewell, Va.

Virginia Road Builders' Association

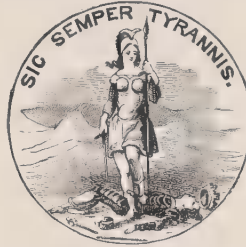
Organized Nov. 23, 1911

THE OBJECT OF THIS ASSOCIATION IS TO DEVISE
THE MOST EFFICIENT METHODS AND APPLIANCES
FOR ROAD BUILDING AND MAINTENANCE.

Through the courtesy of the publishers of SOUTHERN GOOD ROADS this page each month will be devoted to the interests of the Virginia Road Builders' Association. It is hoped that the members of the Association will feel free to make use of it. All communications should be forwarded to the Secretary.

By order of the Executive Committee.

C. L. SCOTT, JR., Secretary



EXECUTIVE COMMITTEE

Hon. G. P. Coleman
Richmond, Va.

Maj. E. H. Gibson
Culpepper, Va.

B. W. Hubbard
Forest Depot, Va.

D. Tucker Brown
Evington, Va.

C. B. Scott
Lynchburg, Va.

ARTICLE III. CONSTITUTION

MEMBERSHIP

Section 1. The membership of the Association shall be composed of all persons interested in road building in the State of Virginia who shall make application to the Secretary and pay the annual dues for one calendar year in advance.

ARTICLE I. BY-LAWS

Section 1. The annual dues shall be one dollar and shall be payable in advance.

The third annual convention of the Virginia Road Builders Association will be held in Richmond, Va., about the first of February, 1914. The exact date will be announced later.

The following members have been appointed a committee of this association to draft desirable amendments to the present road laws of the state of Virginia and present them to the next legislature:

Hon. P. St. J. Wilson, State Highway Commissioner.

Mr. Wm. F. Cocke, assistant engineer, S. H. Commission, Richmond, Va.

Major E. H. Gibson, Commonwealth's Attorney, Culpeper, Va.

Mr. Otto L. Evans, Commonwealth's Attorney, Amherst, Va.

Mr. C. L. Scott, Jr., assistant engineer, S. H. Commission, Waynesboro, Va.

Suggestions are invited from all persons interested.

* * *

Tazewell county, Va., is expending \$600,000 in highway construction. Mr. W. I. Lee, member V. R. B. A., county engineer will shortly contribute an article to Southern Good Roads, describing the work in that county.

Washington county has a force of 85 convicts engaged in the construction of the portion of the Bristol-Washington Highway through that county.

Russell county has expended \$150,000 in improved roads and is now doing additional work costing about \$400,000. Mr. A. H. Pettigrew, member V. R. B. A. is county engineer.

Roanoke county, Virginia—Work is to begin on the road between Roanoke and Salem on the north side of Roanoke river about Jan. 1st. The convict force now on the Williamson Road will be moved to this work. Mr. H. Hocutt, member V. R. B. A., is superintendent.

In Smyth county, Va., the work resulting from the recent bond issues, is in charge of Mr. B. E. Rhoads, member V. R. B. A. Bids will be received for grading and macadamizing 74 miles, in Marion District, and grading and macadamizing 24 miles, and for grading about 20 miles in St. Clair District, on Nov. 3rd.

* * *

Mr. Preston Belvin, of Richmond, Va., president of the Virginia State Automobile Association, is hard at work advertising the approaching meeting in Richmond of the American Automobile Association. He is sending out the following letter to automobile clubs, good roads associations, chambers of commerce and other bodies throughout the state:

"The American Automobile Association will assemble

in annual convention in the city of Richmond, Virginia, the 1st, 2nd and 3rd of December, 1913.

"We trust you have already elected your delegates to this convention, and as this will be a very important session, we trust that the delegates or their alternates will be in attendance.

"This letter is more especially intended to invited the officers and the individual members of your Club to be present and to be in touch with the convention.

Monday, December 1st, will be devoted to the general business of the convention.

Tuesday, December 2nd, will be devoted to entertainment and sight seeing.

Wednesday, December 3rd, will be devoted to the election of officers.

"We will thank you to let us know on or before Nov. 15th how many of your individual members will prob-



Beautiful Lime Stone Macadam Road in Campbell County, Virginia

ably attend the sessions of the convention of the American Automobile Association. We truly trust a large number will come. Not only is this the wish of the American Automobile Association, but it is the desire of both the Virginia State Automobile Association and the Richmond Automobile Club. Bring your ladies, a special committee of ladies has been appointed to entertain them."

* * *

Highland county, Virginia, has contracted for two steel bridges to be erected soon.

Jim Wells county, Texas, will vote on the 25th of this month on a bond issue of \$125,000 for bridge and culvert building.

Road-Building, Road-Boosting and Road-Boosters Throughout the Nation

The good roads movement throughout the country is to have the substantial support of the postoffice department, according to notices received by postmasters throughout the country.

First Assistant Postmaster General Roper in the notice says:

"It is the desire of the department that they co-operate with state and county authorities in the endeavor to improve the condition of the public roads."

"The department's attention has been attracted by proclamations issued from time to time by the governors of states designating certain days as good roads days and postmasters as representatives in their communities of the national government, are expected to manifest as active an interest in this movement as is consistent with the proper performance of their official duties."

* * *

Recently the people of Graves county, Kentucky, decided to work the roads and veracious newspaper chroniclers assert that 5,000 men and boys worked valiantly on the roads for two days, simply working wonders in that county. As the Louisville Courier-Journal puts it, "this means that good roads sentiment has made a high-water mark in Graves county. No wonder that 'old men said it was a scene the like of which they had never seen.' The older generations never manifested much interest in road workings, and it is to be doubted if the oldest inhabitant ever before saw as many as a hundred men engaged in working the roads of the county at one time. If he ever saw as many as a hundred it is a safe bet that at least fifty of them were sitting down, watching the other fifty do the work."

* * *

The Hillsboro (Tex.) Mirror quotes Mr. George E. McDaniel, a good farmer of that section, as follows:

"I used to live and farm in Hill county but left, principally, to get out of the mud. My house is situated several hundred yards from the road. During the recent wet spell there was a fine market for hay at Milford. I had plenty of hay and decided to take advantage of the good market, so I loaded up several wagons and doubled my teams to get the hay to the pike road. From there to Milford a single team to each wagon hauled the loads with ease. If I had lived in the mud, I'd have lost the chance to sell on a good market."

* * *

Good roads as they affect the farmer in the marketing of his crops was one of the subjects to engage the attention of the International Dry Farming congress at Tulsa, Oklahoma, on October 30. Dr. William Peterson, professor of geology and head of a department of good roads in the Utah Agricultural college, was the first good roads advocate on the program. His subject was "The Cost of the Hill Between the Farm and the Market Place."

* * *

October 21 was "Good Roads Day" at the Texas state fair and there was an interesting exhibit at the building of the A. & M. College. Prof. R. J. Potts, professor of highway engineering at the college, was in charge, assisted by Prof. R. B. Pearce, another member of the faculty. They discussed road problems in an interesting manner and were ready at all times to

answer the questions of the thousands who swarmed about the exhibits.

Prof. Potts is perhaps the best posted man on road building in Texas today, having been actively allied with this work in all sections of the state.

The good roads exhibit was one of the most interesting and instructive features of the entire college exhibit this year. Models showing road construction of every type were included in the exhibit. Macadam, gravel and earth roads were shown just as they appear when laid. Stone and rock are used extensively in construction work in Texas and form another feature of this exhibit that attracted much attention. Mineral Wells, Jacksboro and other quarries were represented.

Pictures showing road work in many Texas counties were another feature of the exhibit. Stretches of roads photographed before and after improvement carried an impressive message to those who see these photographs of the "road completed." Dallas, Tarrant, Grayson, Ellis and dozens of other Texas counties were represented in this good roads are gallery.

* * *

In response to the call of Governor McCreary, the students of Berea College, Berea, Kentucky, turned out in full force on October 28 to work the roads.

The normal, the college and the vocational departments, with their deans and other faculty members, worked with a will. Many of these students are not Kentuckians, but they went anyway. Owing to the impossibility of providing tools enough for all the students, the academy and foundation schools did not work, but are planning to do so at an early date.

The young women of the normal department walked out to the scene of activities and served dinner for the young men of their department. They afterward joined in the roadmaking and added spice in the way of songs and good cheer to the shovelling and plowing.

A King split-log drag was made with the help of the students, and its efficiency as a dirt roadmaker was demonstrated in the presence of the students and citizens who joined in the labor of the day.

Prof. Arthur H. Blanchard, C. E., A. M., head of the department of highway engineering of Columbia University, New York City, and Mr. Henry E. Drowne, C. E., instructor in the same department, have prepared a "Text-Book on Highway Engineering." It is a book of 762 pages, admirably illustrated, and conveniently arranged for the use of students of highway engineering. The book really "fills a long-felt want" and will doubtless soon be used in every college in the land that has a highway department.

The subject of highway engineering is treated by the authors in twenty-seven chapters, and they cover every phase of it. The subject-matter is arranged along lines suggested by the work of the authors in their class rooms and will be admirably fitted to the work of teachers everywhere.

There are 234 illustrations in the book, comprising half-tones showing all kinds of roads, good and bad, mistakes in building and surfacing, plans, elevations, culverts, drains, bridges, etc.

The book is from the presses of John Wiley and Sons, Inc., New York, N. Y., and it sells for \$4.50.

GOOD ROADS NOTES

GATHERED HERE *and* THERE

Alabama.

Hon. H. G. Willingham, state superintendent of education in Alabama, has sent out a statement to teachers, school officials and school committeemen throughout the state of Alabama, asking them to attend the meeting of the Alabama Good Roads Association at Mobile on November 20, 21 and 22. Mr. Willingham says:

"On November 20, 21 and 22nd, the Alabama Good Roads Association will hold its annual meeting in Mobile, and I would respectfully urge all school officials, including local trustees who can conveniently do so, to attend the meeting.

"Good schools and good roads go hand in hand. The rural sections of Alabama are making decided improvements in many ways in their public schools, but observation leads me to believe that these better rural schools are located usually in those sections which have improved their public highways. The encouragement of good roads is really an encouragement for better public schools."

* * *

Arkansas.

The good roads movement in Arkansas received a powerful impetus at the Arkansas State Fair at Hot Springs on October 28, which was "Good Roads Day." Governor George W. Hays, State Highway Engineer E. A. Kingsley, W. B. Owens, secretary of the state highway commission, County Judge Joe Asher, of Pulaskin county, and Mr. George D. Marshall, U. S. government road expert, took part in the speaking.

Mr. Kingsley introduced Governor Hays, who made a very fine speech, arousing a great deal of enthusiasm.

"I am sorry," said the governor, "that I am not an expert on good road building, but I am glad that I am an expert in advocating good roads. If there is one thing that will build up, push forward, develop the resources and enhance the property value of the state, it is good roads."

Governor Hays then referred to the two good roads days Arkansas recently celebrated. He said that the citizens who participated in the work of improving their highways donated more than \$250,000 in labor and money on those days. The enthusiasm for this work, he said, started long before the two days he had designated and he said the good results are still being felt in an increased demand for better roads.

"Give a man in the rural district a good road and he can travel 15 to 20 miles in the same time that it will take him to go five miles or ten miles over a bad road," said Governor Hays.

* * *

Colorado.

The Colorado Road Builders' Association held their annual meeting at Pueblo, Colorado, last month. It was said to be the best good roads convention ever held in the state. Among the big speakers on the program were Hon. T. A. Ehrhart, state highway commissioner of Colorado, and Hon. T. J. Tynan, the famous warden of the Colorado state prison, who is known all over the country as the man who introduced the honor system in dealing with road-working convicts.

Warden Tynan's address was replete with interesting details. He stated that although the biennial ap-

propriation for the penitentiary by the last legislature was but \$200,000, yet he anticipates that within that time, the convict road builders will have completed \$500,000 worth of road building, and the builders represent less than 40 per cent of the prisoners. A careful estimate of the expense of the convict camp in the various counties for two years shows that the expense per man has been 32 cents a day. This includes the total expense to the county.

There are now five convict road camps, one in Weld, Larimer, Parkdale, Garfield and Pueblo and the warden expects to establish a sixth before the close of the year. He declared that there is demand for forty camps, but there are not the men available. Sixty per cent of men in the penitentiary are not considered trustworthy to place in open road camps.

Taking the totals mileage built by these convict camps in two years together with the total cost, reveals that the construction has cost \$278 a mile for labor.

* * *

Florida.

Governor Park Trammell, of Florida, has joined the ranks of the good roads governors of the nation with a proclamation setting aside Friday, Nov. 21, as "Good Roads Day." His proclamation follows:

"The State of Florida, Executive department.

"By the governor—a proclamation.

"Whereas, the construction of good roads is essentially a practical problem; and the value of good roads is shared, directly or indirectly, by all the people in every locality; and

"Whereas, one of the greatest needs of practically every county in Florida is a well devised and well constructed system of durable rural highways and it is clear that the securing of same would provide an inestimable blessing—affecting not only the commercial but also the social and educational life of the respective communities—to every section of the state which will put forth sufficient determination, effort and skill to build suitable good roads; and,

"Whereas, the citizenship of Florida is as progressive and resourceful as is to be found anywhere in the world and is in this age manifesting an increasing tendency to keep in the forefront of all enlightened movements looking to the betterment of the masses of the people; and,

"Whereas, the most effective way to secure desired results is to proceed in the most direct way to achieve them;

Now, Therefore, I, Park Trammell, governor of the state of Florida, mindful of the urgent need of the people of all parts of this state for improved public roads within the several counties and to connect the several sections of the state, do hereby designate and proclaim Friday, November 21, 1913, as state roadwork day; and I earnestly urge all able-bodied men of every locality in this state to set aside their usual occupations upon the said date and join with their neighbors in an intelligent, whole-souled, practical effort to repair their present roads and to inaugurate for the future the building in their respective localities of substantial and durable roadways, thus following an example which has already been started in one or two of the states ad-

tended by results of the most valuable character; and thus placing Florida well in the lead in this section of the nation in advancing the movement for obtaining a thorough system of good roads—one of the most pressing needs of the American people of this day.

"It is urged that the newspapers of the state, the county and city officials and the people of Florida generally take this matter up with zeal and enthusiasm and thereby cause the first state roadwork day to be observed in Florida to be one of such success that future efforts in this direction will be universally welcomed and universally supported.

"In witness whereof, I have hereunto set my hand and caused to be affixed the great seal of the state of Florida at Tallahassee, the capital, this, the 27th day of October, A. D. 1913.

(Seal) "PARK TRAMMELL, Governor,

"By the governor, attest:

"H. Clay Crawford, Secretary of State."

* * *

Illinois.

Only two counties in the state of Illinois have decided not to accept state aid for highway improvement as provided in the new Tice good roads law. A report made public Springfield by A. N. Johnson, engineer for the state highway commission, shows that every county in Illinois with the exception of Knox and McLean has signified in some way its intention to comply with the new act.

Seventy of the counties have fully complied with the law by filing county maps of roads which it is proposed to improve. Thirty others have filed tendents, but have not offered their maps and forty of the entire one hundred counties thus represented have adopted resolutions which have put them in line for the state aid for this year.

The highway commission is highly gratified with the general interest shown in the new law and it is believed that next year every county in the state will be in line for its share of the appropriation for that year for highway building.

* * *

Kansas.

With the highway on every section line in Kansas designated as a county road, the revenue from the state motor car license law will provide sufficient funds to drag these roads four times each year, according to figures prepared in the office of Secretary of State Charles Sessions. In other words, the \$150,590 which goes into the permanent county road fund this year by virtue of the motor car license law, is sufficient to permanently maintain 50,000 miles of road or 100 county highways north and south the length of the state and 75 highways east and west the length of the state.

The motor license law is now showing in practical manner the benefits which the state will reap in the matter of good roads. The figures which have been prepared in the secretary of state's office are a revelation to the men who have boosted for good roads but secured limited results. With the present township and county road fund levies, the motor license fund will supply sufficient money to maintain every main traveled public highway in the state.

* * *

Kentucky.

A dispatch from Frankfort, Kentucky, says that it is probable that "Good Roads Days" will be called again in Kentucky next spring. State Highway Commissioner Terrell said if the movement is continued next year it will be in the spring, as that is the more desirable time for working roads. That puts the highways in

shape for summer travel, instead of leaving them bad during the season when they are most used, and then working them over in the fall just before bad weather sets in. Dirt roads, he said, especially should be worked in the spring rather than in the fall.

Commissioner Terrell said from reports received by him it is evident that rain spoiled the plans in many counties, which had fine organizations for work on the "Good Roads Days" last month. The reports are not sufficiently specific to give an idea of how much was accomplished or the value of the work. Some of the county engineers stated in their reports that another date this fall may be fixed for working the roads.

Among those who passed the recent examination for county road engineers conducted by State Road Commissioner R. C. Terrell were County Engineer J. R. Gaines, of Jefferson, and his assistants, W. F. Milner and R. H. Rivers. All are civil engineers and were not required to be examined. Others who passed were W. R. Fields, of Marshall county, and Virgil C. Chatham, of Mercer.

* * *

Louisiana.

Mr. W. E. Atkinson, state highway engineer of Louisiana, gave out the following statement a few days ago:

"Our board is advertising the contracts to be let on Nov. 24 for the construction of five roads, aggregating sixteen miles in length, branching from Lafayette. These roadways will be gravel and we hope to have several bidders. Nothing is of more importance or has more to do with the prosperity of both the farmer and the merchant than good roads.

"There are three excellent roads in Sabine Parish, and a fourth is now being surveyed. The three roads aggregate about forty-five miles, and with the addition of the fourth there will be a total of about sixty miles of good roads and concrete bridges. A road district has been created out in Thangipahoa Parish, and the election for bonds will be held about Nov. 8, I am informed. The road district leads out of Hammond.

"Our engineers are now engaged in making a survey in Bossier Parish for a roadway. It is the object of our board to build good roads from leading centers, such as the parish seats, and when the United States Government does make an appropriation they will find a number of good roads as connecting links. There is a bill now pending before congress calling for an appropriation for public highways, and all of us hope it will be passed. There appears to be a strong public sentiment everywhere in favor of good roads, and the people seem to be more willing to be taxed for them today than they were some years ago."

* * *

Michigan.

At a meeting of the directors of the Lake Huron Shore Good Roads association, held at Detroit, Michigan, recently, the directors decided to hold their annual meeting in Bay City, January 21, 1914. The association is composed of the eight shore counties from Bay City to Mackinaw, and has for its object the maintaining of a good road from Bay City to the straits of Mackinaw.

During the past summer, a great deal of road work was done along the line of road, and part of it has been adopted as the state trunk line highway provided for in the last session of the legislature. A vast improvement was accomplished this season by the "road bee" on June 9, over 10,000 citizens living along this road turning out and working on the road that day.

The directors have appointed June 4 and 5, 1914, as

the Lake Huron Good Roads association "Bee Days" and from the enthusiasm manifested by the farmers and people along the line of road, Bee Days, for 1914, will be a greater success than in 1913. The association has arranged for road signs for the entire route, and also that the route be published in the automobile blue book for 1914.

* * *

Mississippi.

The vice presidents of the Mississippi State Highway Association met last month in Hattiesburg to decide upon a route from the Corinth-Gulfport highway that is to run through the entire eastern part of the state from north to south. It is planned to make this road one of the very highest type, surfaced with asphalt, or some other up-to-date material.

Lauderdale, Jasper, Forrest and Harrison counties were represented at the meeting and their representatives were able to decide on a route without serious disagreement.

Jones and Clark counties, though ready to begin work on the highway, were not represented at the meeting and if they can get together the entire route south of Meridian will have been established. North of Meridian, the road from Corinth south to Kemper county has been decided on but the road through Kemper has not been located.

When the route is finally determined on a U. S. government engineer will be detailed to help with the work of locating the road and supervising construction.

The Hattiesburg meeting was presided over by Mr. H. A. Camp, vice president of the southern division of the Mississippi State Highway Association.

* * *

North Carolina

Davie county, one of the smallest in the state, which voted bonds for \$175,000 for road building a few months ago, is making fine progress in improving its roads.

Recent orders made by the Davie Highway Commission, have started operations on the following roads:

Road from Cooleemee to Cooleemee Junction, a distance of two miles, located and now under construction.

Road from Mocksville to Frost's farm (towards Holman's) a distance of two miles, located and under construction.

Road from Holman's to Chestnut Grove School (toward Yadkin county), a distance of two miles, located but contract not let.

Road from Advance to Elbaville, a distance of two miles, now nearing completion.

Specifications and contract forms have been prepared and it has been decided to do most of the work by contract. Contractors have been asked for bids on the work not yet under construction.

Many new bridges have been contracted for and Mr. J. N. Ambler, civil engineer, is engaged in preparing specifications for others. The roads under construction are the very best type of top-soil and sand clay roads.

The response to Governor Craig's "Good Roads Proclamation" at the University of North Carolina, was prompt and striking. Dr. Edward K. Graham, acting president of that institution, wrote a letter to Dr. Joseph Hyde Pratt, state geologist, that is worth space here. He said:

In response to the proclamation of Governor Craig that November 5th and 6th be observed throughout North Carolina as Good Roads Days, the University has outlined the following program which I submit for criticism and suggestion:

1. Lectures. (a). Chapel Talks. November 4th, the Significance of the Good Roads Days, Dr. Joseph Hyde

Pratt. November 5th, Road Work in North Carolina, Prof. M. H. Stacy. November 6th, illustrated Lecture (night) Road Building Government Expert.

2. Supervision. Professors Stacy and Hickerson, of the department of civil engineering will give their services and the services of five competent men from the higher classes in road engineering to take charge of groups of workers in Orange county under your plan of organization.

3. Publicity. The county clubs of the University will distribute such literature as you can furnish and will write articles for their home county papers on the subject of good roads, and the importance of this present effort.

4. Actual Road Work. Volunteers from the University community will be available in large numbers to work any given piece of road if the Survey finds practical a plan for using them on the afternoons of November 5th and 6th.

We will appreciate any suggestions you may make supplementary to this program.

The value of these two days will come not so much in the actual road constructed, through that will be great; but in driving home the fundamental idea, so difficult to hold steadily in mind that our government is primarily a co-operative enterprise in constructive achievement. Every blow struck on our highways makes emphatic and personal this great idea.

The road is not merely an avenue of trade and community intercourse; it is a symbol of community strength and a test of our grasp of the meaning of democracy.

* * *

Texas.

In order to gather strength and enlarge the scope of its work, the Texas State Good Roads Association has decided to become a member of, or affiliated with, the National Highway Association. This was announced recently by John W. Warren, president of the state association, after a conference he and Secretary D. E. Colp of the Highway League division of the San Antonio Chamber of Commerce, held with W. A. Alsdorf representing the National Association. Sanction for the federation was given at the Good Roads Congress held at Corpus Christi last summer.

Once affiliated with the National Highway Association, the state body will be in position to ask and expect federal aid in carrying on the good roads movement and in the construction of main trunk highways. Affiliation will in no wise interfere with the identity of the state organization.

The affiliation of the two organizations was completed on October 29 when the executive committee of the Texas Good Roads Association met at Dallas. Mr. Alsdorf attended the meeting and made a speech. At this meeting it was decided to hold the mid-winter meeting of the association at Fort Worth during the latter part of January, the exact date to be announced later.

Among the members of the committee present at this meeting were:

J. W. Warren, San Antonio, president; G. W. Baker of Dallas, E. F. Edwards of Fort Worth, D. E. Colp of San Antonio, E. W. Kirkpatrick of McKinney and Homer D. Wade, of Stamford, secretary.

An interesting program is promised for the mid-winter meeting of the association in Fort Worth during January. Thomas Tynum, warden of the Colorado penitentiary, is one of the speakers on the program.

On the same day Dallas was the scene of another interesting meeting when 100 delegates representing va

rious counties and organizations in the state, got together and organized the Texas Convict-Built Roads Association.

This movement was headed by the Galveston Chamber of Commerce on September 10 when they mailed letters to every commercial club of the state, asking for their opinion on convict labor for state highways, and also inviting them to the convention in Dallas on October 29. Over 100 men from all sections of the state, and representing many of the leading organizations were present. Also prominent in the meeting were many of the Texas legislators, who are pledging themselves to see that the movement does not lack support in that body when the final test comes at the next gathering of law makers.

The following resolutions, expressing the sentiment of the new association, were adopted:

1. That the name of the organization shall be the Texas Convict-Built Roads Association.

2 The officers shall be a president, a general vice president and a secretary and treasurer, who are to compose the executive committee.

3 That the organization should have one vice president in each senatorial district of the state, making the board of vice-presidents number thirty-one; that the nominating committee should use when possible, the men who attended the meeting in Dallas.

4 We, the Texas Convict-Built Road Association, offer the following resolution: Resolved, that we favor and advise working state convicts of the first class on the highways of this state by the state.

* * *

Washington.

To take the building and upkeep of good roads out of the hands of the politicians is one of the hobbies of Governor Ernest Lister of Washington. Recently he made a tour of Europe in his motor car for the purpose of a personal study of the methods used on the continent. His tour covered some five thousand miles. A vast fund of information was secured. During the tour of the western governors who met at Denver not long ago Governor Lister spoke at almost every stop on the subject of good roads.

The governor believes the state should spend all the money it can for the building of good roads, but he decries the heavy bonding of the state or of any community in order to build them. He does not believe the people should be taxed without reason for any purpose.

"Every road constructed should be a permanent construction and not merely a temporary affair. The old way of building roads," said the governor, "was for the road supervisor of a district to choose those men to work for him who could deliver the most votes, without regard to their ability to construct good roads. That system is in vogue no more. Men are now chosen for their ability to do the work, and politics is no longer a factor. I am traveling about the state in order that I may learn at first hand what the various public officials are doing, and when I find a man who is not making good I discharge him and fill his place with a competent man. That will be my policy as long as I am governor of the state of Washington."

* * *

Wisconsin.

Distribution to counties of the \$1,230,000 state highway appropriation in Wisconsin, available for construction in 1914 has been made by the state highway commission. The total amount voted by county boards was \$1,548,839.48, so that the funds are over subscribed by about \$320,000.

According to State Highway Engineer A. R. Hirst,

about 1,600 miles of road should be built next year under the state aid law, and about 300 bridges. All the counties are now doing work under the law. There are 1,588 units of government which might receive state aid, and of this number 1,211 applied for it. A number of counties, failed to call for state aid to the aggregate amount of \$59,786.85, which amount will be apportioned according to the ratio of their pledges among certain other counties which together called for \$378,626.33 more than they were entitled to.

Milwaukee's apportionment is the largest, Dane is second, Rock third and Dodge fourth.

It is estimated that the aggregate mileage of good roads built in Wisconsin next year will exceed that of the present year by 500 miles.



The city of Jackson, Mississippi, will spend \$25,000 in the construction of four re-inforced concrete bridges.

The board of aldermen of the city of Charlotte, North Carolina, have recently ordered the Seaboard, Southern and the Charlotte Electric railways to build a number of bridges in different parts of the city.

Hughes and Okfuskee counties, Oklahoma, will build a bridge across the South Canadian river, the expense to be divided equally between the two.

Bexar county, Texas, will vote on the 12th of this month on a bond issue of \$200,000 to be used in building concrete bridges.

The town of St. Augustine, Florida, will build a bridge across San Sebastian river.

Washington county, Maryland, will bridge Antietam creek.

Road district No. 2 of Clay county, Mississippi, will let contracts soon for many new bridges and culverts in connection with road improvement.

Smith county, Mississippi, will construct about a mile of wooden bridges.

The commissioners of Buncombe county, North Carolina, have contracted for six steel bridges.

Fairfax county, Virginia, is contemplating calling an election to vote on a road bond issue of \$90,000.

Marshall county, Oklahoma, has voted bonds for \$50,000 for building bridges.

The commissioners of Harris and Galveston counties, Texas, have contracted for a bridge across Clear creek to cost \$25,000.

Rappahannock county, Virginia, will construct a bridge across Rush river 111 feet long.

Lawrence county, Tennessee, will vote December 16 on a bond issue of \$200,000 for roads.

Winston county and Cleburne county, Alabama, have each contracted for state aid road amounting to \$8,000.

Pike county, Mississippi, has contracted for the improvement of 60 miles of road amounting to \$199,175.

Reagan county, Texas, has awarded contracts for the building of 36 miles of good roads.

Montgomery county, Tennessee, votes this month on a bond issue of \$100,000 for roads.

Precinct No. 1 of Robertson county, Texas, has funds on hand sufficient to build 50 miles of good roads. Contracts have been let for the larger part of the work.

On the Road to Pisgah

By N. BUCKNER, Asheville, N. C.

A TRIP over the exclusive automobile road, seventeen miles long, built by Mr. George W. Vanderbilt at a cost of \$51,000, is one of the rarest of treats afforded the visitors to Asheville during the past summer. The distance from Asheville to the entrance of this great highway is twelve miles over a fine improved road, seven miles of which is macadam with five miles of sand-clay, built by the county of Buncombe, which road passes through Hominy Valley, dotted with splendid farms and beautiful country homes, turning abruptly westward at Candler, N. C., around a great mountain spur into the south Hominy road. As the au-

saddle of the ridge (5200 feet above the sea level) between Pisgah on the north and Little Bald on the south is nine miles, two miles of which are practically level, scaling the side of the great mountain and immediately overlooking the beautiful Pink Bed Forests. The name "Red Beds," however, would be more applicable inasmuch as the great table land between the towering mountains on either side is covered with the beautiful red of the sourwood forests, dotted here and there with occasional patches of the dark green balsam trees, altogether forming a scene of wondrous beauty and grandeur.

There were five hundred tons of dynamite used in blasting, much of the road being cut from solid gran-



Pisgah Forest Road on East Side of the Mountain

tomobile turns sharply around the curve at the end of the mountain spur, the bold heads of Pisgah, with the Rat, burst into view like great sentinels guarding the quiet valley below! Passing through this south Hominy Valley for four miles, one enters the automobile highway through a gate beside which stands the attractive little country home of the gate-keeper and Ranger on the eastern side, where the little woman of the house carefully scrutinizes the passes for the number of automobiles that are to go over the road. Passes to traverse this road are issued at the main office of the great estate at Biltmore and only the number of cars authorized are permitted to enter on the road, all being required to start and come back together in order to prevent meeting of the cars on the mountain.

From the entrance of the exclusive highway to the lodge, Mr. Vanderbilt's summer home—situated on the



Another View of the Pisgah Road

ite. The approach immediately in front of the Lodge is around the face of a precipitous bluff of granite with a great wall of masonry built on the bluff side to within fifty yards of the lodge. It required two years with a force of one hundred men to build the road, or rather a force of men working eight months in each year, as no work was done during the winter months. The

road has been surfaced with the gritty sand, found along a large part of the road, and is kept in perfect condition the entire year.

The road winds about the face of the mountain in winding curves or switchbacks, the extreme gradient being seven per cent and ranging from that down to two per cent, the average being from three to four per cent. Vista views of the valleys and mountains catch

the eyes at numerous places, nine separate ranges being visible at several points piling up into the sky.

The Lodge, where Mr. Vanderbilt spends eight to ten weeks each summer, is quaint and old fashioned, though the interior has every modern convenience. It is built of logs and there is a covered walkway connecting the "big house" and kitchen as in the real old fashioned homes throughout the mountain region.

The Federal Road Building Policy

By HON. DAVID F. HOUSTON

Secretary of Agriculture

The suggestion of great national trancontinental roads appeals to my imagination, as does the suggestion of interstate roads connecting capitals or cities of commercial importance to my logical faculty and to the sense of pleasure that I experience in riding about the country in my friends' automobiles. But that the essential thing to be done is the providing of good roads which shall get products from the community farms to the nearest station and make rural life more profitable, comfortable and pleasurable, I entertain no sort of doubt; and it is obvious that the representatives of the people in congress are like minded. For in making their appropriation they stipulated that it should be used in improving the condition of post roads with a view to the economy and efficiency of postal delivery and for the transportation of farm products to the market. Such roads are equally essential to the establishment and operation of decent elementary and secondary schools for the benefit of the country boys and girls. I do not eliminate other things for consideration and I do not underestimate the rights and pleasures of the automobilists and the service they have rendered in the propaganda for road building.

There are complex problems to be solved in many states before the most efficient expenditure of money by states and communities for roads can be secured, and there are many more to be worked out before one can rationally expect the federal government largely to participate. Who shall say how aid should be apportioned so that the states may receive equitable treatment? Shall it be apportioned equally among the states on the basis of total population, farm population, area, taxable valuation, road mileage, or all these; and should federal money be expended exclusively through its own agencies for a certain system? What roads are to be improved? There are approximately two and a quarter million miles of publicly owned roads in the nation. Half of this mileage is utilized for post roads and less than ten per cent of the total can be classed as improved in any larger sense. Shall we undertake to apply aid to all the roads or shall we consider this a task too gigantic? Shall we apply it to the rural routes or shall we regard this as equally beyond reason? Or shall we single out certain directions in which central roads shall run, and if so how? Is it not clear that this opens up a field where petty politics, community interest and individual selfishness may run riot? Assuming that we have settled this, for what purpose shall the aid be granted and in what proportion? Shall it be exclusively for construction, exclusively for maintenance, or for both? Shall it be to pay the entire cost of either or both of these items, or shall it be dependent on the equal or larger

contribution by the states and communities? Shall the aid come through votes of money out of the treasury or from the sale of bonds?

That the suggestion of federal aid to road building raises grave questions and involves possible dangers, no thoughtful citizen doubts. There are proposals before the public mind which would bankrupt the federal treasury and suggest possible abuses before which those of the worst pork-barrel bills of the past would pale into insignificance. No proposal which does not carry with it the assurance of safeguarding the treasury in this direction seems to me to stand the ghost of a chance of favorable consideration. It is not alone the fear that there would be no stopping place. There is the question of precedent. This is not the only proposal before the American Congress involving the suggestion of huge appropriations. There are others which, to their advocates, are just as important and are being just as insistently urged; and many of the veteran congressmen have naturally contracted the habit of balking automatically at such proposals.

It would be especially pernicious if such aid should result in stifling the spirit of local self help. In this field as in others, the states have recently made great headway, and any action taken should unquestionably result in the fostering of this spirit and in the efficient direction of the activities to which it may lead.

Another difficulty to be avoided is the over-centralization of activity in these intimate internal matters and the building up of a great and powerful bureau in Washington, with an ever-increasing control over the highways of the country. The dictates of prudence and experience are that so far as possible such agencies as may be required should be efficiently developed in the several states and that the federal agencies should work in a spirit of complete and helpful co-operation and assistance.

The first practical essentials in the planning of road legislation would seem to be to recognize the states as the smallest unit with which the federal government might deal. This would give relief in a measure from the insistent demand that would come from every township and every district in the Union for its share of state or federal assistance, without reference to the merits of the case or the practicability of the undertaking. As has been stated, many of the states now have efficient state highway departments, and thus afford organized agencies with which the federal office could deal. It would seem that the basic feature would be such co-operation between the states and the federal government as would leave with the states the initiative in the selection of roads to receive aid, and as much of the immediate construction and maintenance as would be practicable. In the case of roads on which federal money is to be expended it would seem essential and wise that the federal agency should have the requi-

*Address delivered at the Third Annual Road Congress, Detroit, Mich., September 29-October 4, 1913.

site power of the approval of the selection, supervision of the construction and maintenance, and the right of inspection, for the plain and simple ordinary purpose of seeing that the federal money is applied to the purpose for which it was voted and is efficiently expended.

It is reasonably clear that for every reason there must be some automatic check upon the demands to be made upon congress and that this should be afforded through the requirement that the states and the localities should contribute an amount both for construction and maintenance at least equal to and possibly double that contributed by the federal government; and that, in the apportionment of any possible federal funds a number of basic factors such as population, area, wealth, or minimum cost of construction, should control. I have not the least doubt.

There may be those who "will view with alarm" any suggestion that the federal government co-operate with the states financially in road building and more especially that it exercise an adequate measure of control and supervision even over the expenditure of its own funds. The cry of centralization—that the federal government aims unduly to extend its powers may again be raised. Yet, in a field of common interest and of inseparable activities what could be more natural than co-operation and mutual assistance? Why should the two jurisdictions serving the same people forever stand apart and view each other with suspicion and distrust while nothing is done or much is wasted? And is it not worthy of note that the alarm never seizes such people at the stage of the discussion in which it would be of most value? They are not in the least timid in their approaches to the federal treasury and their courage fails them only when it is suggested that the federal government has a right to see that the money of the people of the nation is wisely and efficiently expended. If they are to take counsel of their alarms let them do so before they determine to assault the treasury.

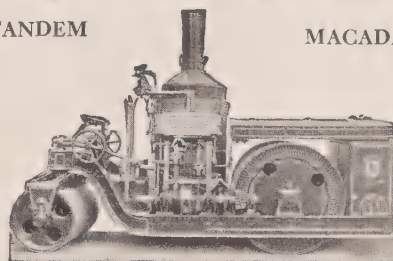
In short, as a practical program, I believe that this matter is one in which haste can best be slowly made. The people will sanction a reasonable expenditure of their money—and it is their money and theirs only, whether it be expended through the federal government or the state—when they are convinced that it is applied to a wise purpose and will yield the results anticipated. And I am impressed by the wisdom of the action of congress, in the midst of so much clamor, in constituting a committee "to make inquiry into the subject of federal aid in the construction of post roads," in providing an appropriation of a half million dollars to be expended co-operatively with the states in the proportion of one to two, and in requiring the secretary of agriculture and the postmaster general to report to congress the results of such expenditure "to-

gether with such recommendations as shall seem wise for providing a general plan of national aid for the improvement of postal roads in co-operation with the states and counties, and to bring about as nearly as possible such co-operation among the various states as will ensure uniform and equitable interstate highway regulations." This indicates a wholesome desire to know the facts as well as a generous interest. Too short a time has elapsed to judge of the value of this undertaking, but that it is in the right direction few will question. That it might be extended with ample funds if aid is to be furnished most thoughtful men would concede; and the plan has the peculiar value of being susceptible of indefinite extension in case the results should be found to justify it.

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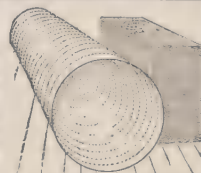
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Through its Land and Industrial Department and its Department of Farm Improvement Work it co-operates with the communities along its lines for the location of Industries and of desirable classes of Farm Settlers and employs expert agents to co-operate with farmers seeking their advice as to improved farm methods, including diversification of crops, the building up of soil productivity, live stock raising and dairying. It has awarded scholarships in the State Agricultural Colleges of the States traversed by its lines to young men who would otherwise have been unable to avail themselves of an agricultural education. Realizing that the farmer who takes up the growing of new crops or the raising of live stock may be discouraged in his first season by the failure to market his products satisfactorily the Company has appointed market agents to give such information relative to markets, methods of packing, shipping, etc., as may be helpful to producers seeking their co-operation.

All of the co-operative development work of the Southern Railway Company is free to all persons in the territory traversed by its lines who may wish to avail themselves of it.

On matters relating to Southern development, or farm and factory openings, call on or address

M. V. RICHARDS

Land and Industrial Agent

WASHINGTON, D. C.

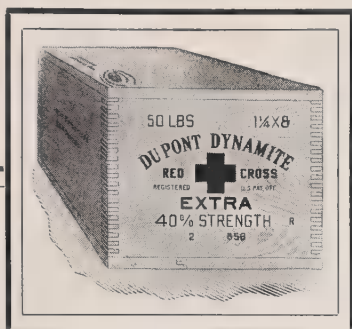


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Our new shale Pipe is unsurpassed in quality and strength. It is used exclusively by North Carolina Counties where highway improvement has long been under way. Prices on application.

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Annual capacity 1900 Cars



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APPROACHING cold weather may cause delays if the explosives are too sensitive to the lower temperatures.

Red Cross Low-Freezing Dynamite is a favorite with contractors and blasting crews because it



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in the coldest weather. It keeps its sensitive properties at low temperatures and delays and dangers incidental to thawing are rarely associated with its use. To contractors now engaged in road-building or who contemplate contracting for winter work, the selection of Red Cross Dynamite will not only do more and better work, but its use eliminates much of the hazard of thawing explosives.

Tell us what you want to do with the explosives. We will promptly aid in solving your problems.

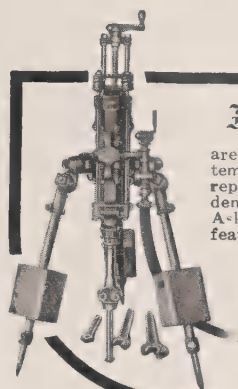
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Write for our trial offer-

RUSSELL GRADER MFG. CO. 2230 University Ave., S. E., Minneapolis, Minn.

Mary has a little lane,
And it is white as snow,
And firm and smooth and cheap because
It's made of **Slag** you know.

The following reproduced from the Mobile Item of September 24th, is self explanatory and needs no comment:

"County Highway Engineer Fay McClure of the Board of Revenue and Road Commissioners at the weekly meeting held Monday, made a report showing the cost of the work of improving 'Mary's Lane' which has been pronounced by experts to be one of the finest in the county. The report which many tax-payers will read with interest is as follows:

Itemized figures are then given in the report showing total cost of Mary's Lane, per mile, to be \$4,629.67 as against \$6,000 per mile for surfacing Hall's Mill Road with chert, or a difference of **\$1,370.33 per mile in favor of the slag road.**

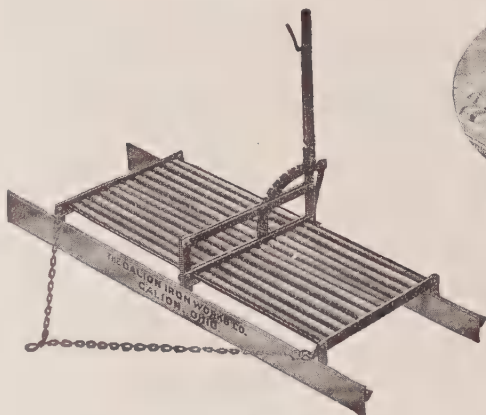
The recent heavy downpours of rain in Mobile County improved the Slag road while all other roads in the county were damaged thereby.

If interested in "Good Roads," write for copy of report giving detailed cost of construction of Mary's Lane.

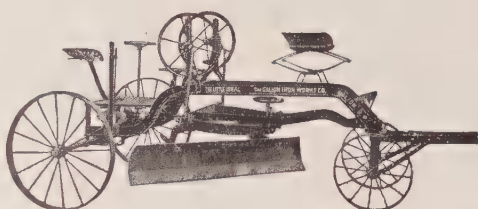
Birmingham Slag Company

1001--2-3-4-5-6 Woodward Bldg.

Birmingham, Ala.



Galion Ideal All-Steel Road Drag



Little Ideal Road Machine



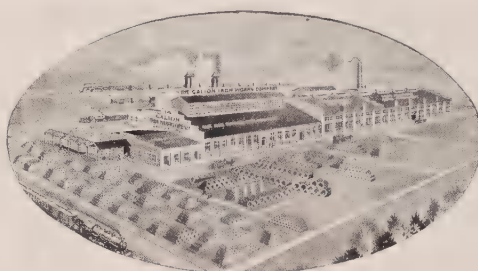
New Imperial Road Machine

PERFECTION	TOTAL LENGTH 8 FT.
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Anti - Skid Attachment for Road Drags.

Best Engine Grader Steering Gears and Portable Stone Unloading Machines made.

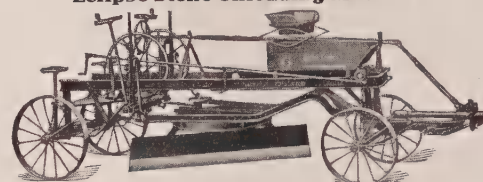
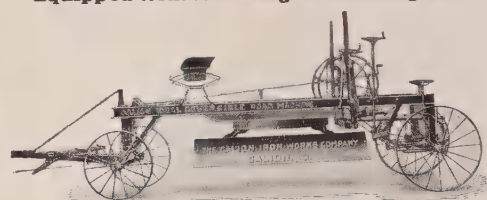
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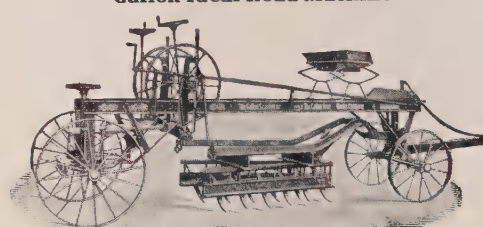
Be sure to see our Exhibit at the American Road Builders Association meeting, Philadelphia, Pa., December 9-12, 1913. We will exhibit and have in regular operation a large working model of our Eclipse Stone Unloader. Also working models of other road making machines, culvert pipes, etc. we make.



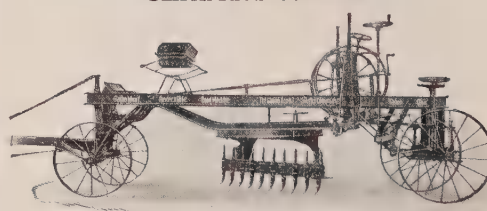
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GIANT ALL-STEEL ENGINE GRADER
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Galion Ideal Road Machine



Galion Ideal Scarifier

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On Ideal Road Machine

Galion Ideal Cast Iron Culvert Pipe



Galion Standard Corrugated Culvert Pipe



Note the Difference

between the condition of the road on the left side of this picture and on the right side.

Half of this road, the side next to the car track, Seventh Avenue, Tampa, Florida, was constructed last year with an oil asphalt binder. It is rapidly going to pieces, as the photograph shows.

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R. T. BROWN
HIGHWAY ENGINEER.
HIGHWAY SUPERINTENDENT FOR ORANGE COUNTY
GOOD ROADS COMMISSION.

Hillsboro, N. C. 10-20-13.

Harry Bros. Company,
Newport, Ky.

Dear Sirs:

Knowing that you are interested in the report made to me on the samples of your culvert which I sent to have analyzed, I will take time to write you a word in regard to it. The analysis was made by the Institute of Industrial Research, Washington, D. C. of a piece of culvert cut from one of a car lot. There was absolutely nothing about the piece to indicate by whom it was manufactured, as I had samples numbered and kept a list by the numbers.

The following is the analysis:

"Carbon-----.012
Manganese-----.019
Phosphorus-----.010

Remarks: The low carbon and manganese indicate that this material is typical of an iron manufactured in the open hearth furnace."

In a letter accompanying the report it was stated that the analysis had not been made for silicon and sulphur as they are not the elements that determine the rust-resisting qualities of an iron. The question was asked of the chemists whether this material was a steel or an iron and the answer was very positive that it is not a steel, but one of the purer grades of open hearth iron.

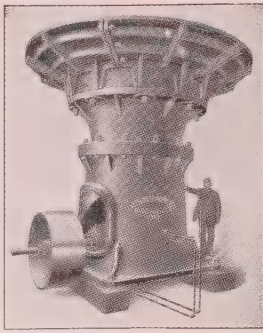
I wish also to state that check for last shipment of culverts will reach you in a few days. Will also soon send you an order for another car.

Very truly yours, *R. T. Brown*
Highway Supt.

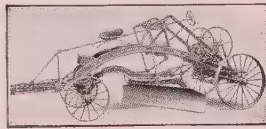
This fac-simile letter from MR. R. T. BROWN, C. E., Highway Engineer in charge of Orange County, (N. C.) Roads, should go a long way towards convincing our customers that there is no better culvert made than those we manufacture. We make no claims that we cannot back up. (Notice date of letter, Oct. 20, 1913). AND WE SHIP EXACTLY WHAT YOU ORDER.

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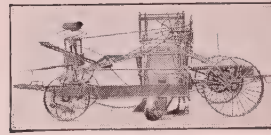
NEWPORT, KY.



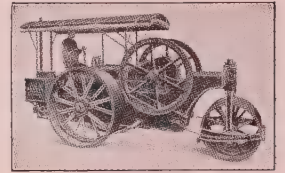
Austin Gyrotory Crusher



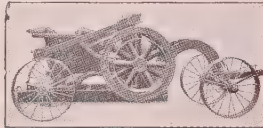
Giant Grader



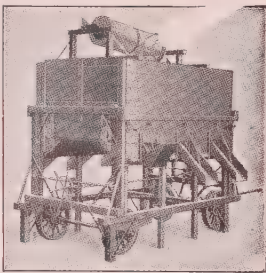
Elevating Grader



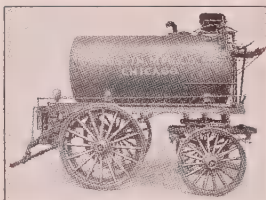
Austin Motor Roller



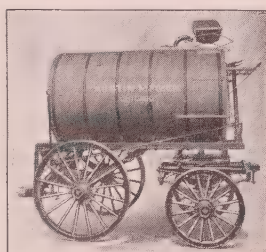
Aurora Rock Crusher



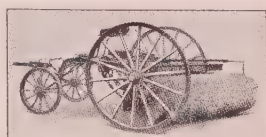
Aurora Bins and Screens



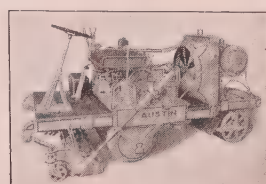
Austin Road Oiler



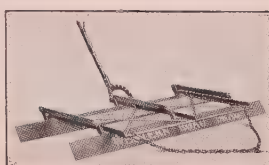
Austin Sprinkler



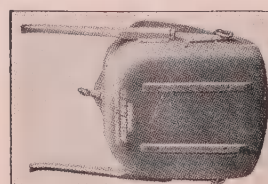
Austin Sweeper



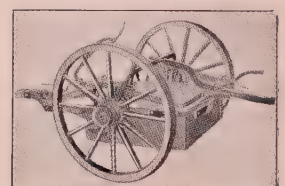
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Drag Scraper



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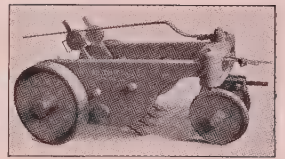
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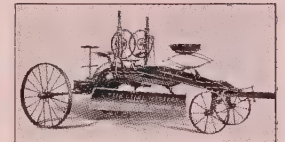
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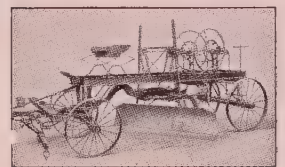
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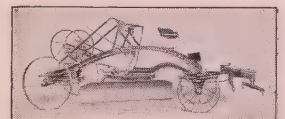
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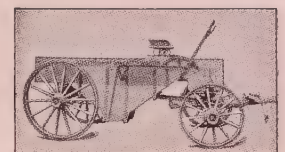
Little Western Grader



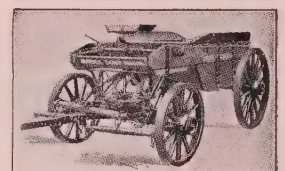
Western Grader



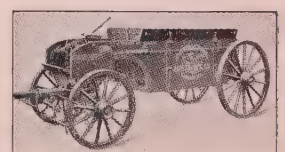
Austin Grader



Austin Stone Spreader



Aurora Dump Wagon



Austin Dump Wagon

The joint committee representing the American Highway Association and the American Automobile Association, has selected Atlanta, Georgia, as the meeting place of the Fourth American Road Congress during the week of October 19, 1914.

SOUTHERN GOOD ROADS

A MONTHLY MAGAZINE DEVOTED TO HIGHWAY AND STREET IMPROVEMENT

Vol. VIII. No. 6.

Lexington, N. C., December, 1913

10c. a Copy

Tarvia
*Preserves Roads
Prevents Dust*

Cincinnati's Experience with Tarvia

CINCINNATI began building roads with Tarvia in 1907, when part of Madison Road, the main eastern thoroughfare from the city was resurfaced with it.

The results were so satisfactory that the tarviated area was extended year by year, and the road has been in such good condition that it was selected for exhibition at the Road Makers Convention in 1912. During these six years the maintenance cost has been trifling, consisting of slight repairs and partial treatment with "Tarvia B."

Erie Avenue, an extension of Madison Road was

resurfaced with "Tarvia X" in 1908. Before that it had required resurfacing every six months. After the Tarvia treatment no maintenance was required until 1912, when some repairs were made and a surface treatment of "Tarvia B" was given.

Grandin Road was tarviated in 1907 and since then has had one surface treatment with "Tarvia B" and other slight repairs.

Burnett Avenue was tarviated in 1908. Two years later it received a surface treatment of "Tarvia B" and is in first class shape now.

Observatory Road was tarviated in 1909 and was not touched for repairs until 1912, when it received a surface treatment of "Tarvia B" at trifling expense.

All these are important and busy thoroughfares which had a serious maintenance problem before Tarvia was used.

Tarvia is made in three grades—"Tarvia X" is a dense, viscid coal tar product of great bonding power, suitable for building macadam roads; "Tarvia A" and "Tarvia B" are thinner grades suitable for roads already in use, to preserve them and make them dustless.

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Booklets on Request



Observatory Road, Cincinnati, Ohio. Constructed with "Tarvia X."



AZTEC ASPHALT



Is now laid in many of the principal cities of the South, as follows: Atlanta, Norfolk, Portsmouth, Charlotte, Raleigh, and Henderson. Aztec Asphalt is the favorite asphalt among engineers, contractors and highway officials because it produces the highest results in paving and road work, and at the same time is economical.



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AZTEC LIQUID ASPHALT

FOR OILING ROADS

For macadam, dirt and gravel roads, Aztec Liquid Asphalt provides the best and most efficient surface treatment. It is a pure, natural maltha possessing the necessary constituents to cause it to penetrate thoroughly the surface of a roadway. Upon evaporation there is left a hard asphaltic binder, which gives the road the appearance of a sheet asphalt pavement.

The great demand for Aztec Liquid Asphalt this season is the result of the experience and recommendation of those who have previously used it.

THE UNITED STATES ASPHALT REFINING COMPANY

90 West Street, New York

State of North Carolina

Build Good Roads with Cement Clay Gravel



The Corporation Commission has made it possible that the State of North Carolina shall be the State of Good Roads at from 1-4 to 1-2 the cost by the use of Cement Clay Gravel.

The greatest thing accomplished by the people of the State of North Carolina in the fight for lower freight rates is the reduction made on Cement Clay Gravel for street and road building, these rates to apply only where towns, cities and counties are benefitted.

Cement Clay Gravel is a natural road material taken from the hills of Harnett County, at Lillington, North Carolina.

Cement Clay Gravel has been used by Wilmington, Fayetteville and Raleigh. Further information and prices on request.

Cape Fear Gravel Co., Inc.

Home Office:
Norfolk, Va.

Plant:
Lillington, N. C.

Trinidad Liquid Asphalt

If your past experience with materials for surface application to roads has included only short lived oils that soon disappear in the form of greasy dust, it is time to investigate Trinidad Liquid Asphalt.

This product has all the stability of the lake asphalt, of which it is a primary form, that in the course of centuries becomes the more solid asphalt of the lake's surface.

Trinidad Liquid Asphalt contains no paraffine; it does not "bleed"—i. e., cover the road surface with sticky particles or pools. It **stays in the road**, and so perfectly incorporates with the mineral aggregate that repeated applications build up a durable bituminous surface.



With ordinary "road oils" successive applications are required to **replace** something that has entirely passed away. Trinidad Liquid

Asphalt is a permanent constructive agent; it is not merely a temporary dust layer.

Made in two grades: Trinidad Liquid Asphalt A—for use cold. Not only prevents dust but forms a waterproof surface for macadam and dirt roads.

Trinidad Liquid Asphalt B—for use hot. Constructs an

inexpensive lasting surface for existing roads, forming a true asphaltic surface coat, which holds the road together and prevents dust.

An illustrated booklet just issued tells the whole story of Trinidad Liquid Asphalt in a few plain words. Send for it.

Before deciding any road or paving problem, advantage may profitably be taken of this Company's 30 years experience, which is at the disposal of everyone interested in good roads and streets. Expert opinions, estimates, specifications and other information will be furnished upon application to

Road Department

The Barber Asphalt Paving Company

PHILADELPHIA, PENN.

SOUTHERN GOOD ROADS

Published Monthly
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Lexington, N. C., December, 1913

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Describing Highway Construction in Tazewell County, Virginia

By W. I. LEE

Highway Engineer, Tazewell, Virginia

TAZEWELL County, Virginia was formed from Russell and Wythe counties, in the year 1799 and named for Governor Littleton Tazewell. Since this period, areas have been taken therefrom in the formation of two adjacent counties, leaving approximately 540 square miles.

Geographically its location is in the southwestern part of the state, about latitude 37° north, and longitude $81^{\circ}30'$ west in the Alleghany Mountains.

There are ten ranges traversing its length, with a general course of north 70° east. These ranges are, namely, Brushy, Little Brushy, Flat Top, Clinch, Rich, Paint Lick, Deskins, Kents Ridge, Little Stony, and Big Stony. In the eastern section a continuation of

The question arising as to their being Magisterial District, or county bonds, was threshed out through the courts. The supreme court rendered an opinion that they were county bonds.

The act provides an additional levy for the annual payment of interest and sinking fund.

That the handling of the sinking fund might be eliminated, it was decided to issue serial bonds which are as follows:

- 7 bonds in each of the years 1913 to 1917
- 9 bonds in each of the years 1918 to 1922
- 11 bonds in each of the years 1923 to 1927
- 15 bonds in each of the years 1928 to 1932
- 20 bonds in each of the years 1933 to 1937
- 25 bonds in each of the years 1938 to 1942
- 47 bonds in each of the years 1943 to 1945
- 49 bonds in each of the years 1946—

These are gold bonds of one thousand dollars each, and the method of their retirement was determined by the increment of increase in the future assessments, based on that of the past.

A financial statement of the county follows:

Amount of bonds issued \$625,000.00, allotted to each of the three Magisterial Districts to wit:

Clear Fork Magisterial District	\$250,000.00
Jeffersonville Magisterial District	\$200,000.00
Maiden Spring Magisterial District	\$175,000.00

Total \$625,000.00

Date of issue January 1st, 1912, and rate of interest 5%.

Assessed valuation year 1911 \$8,000,000.00

Tax rate per \$100.00 year 1911—

State 35 cents, county \$1.23 1-3, total \$1.58 1-3.

Ordinary expenses \$90,000.00

Population last census 24,946

The acts authorizing the bond issue provides concurrent jurisdiction over the expenditures of the State Highway Commissioner and the county board of supervisors.

Parties were placed in the field late in the year 1911 making locations, which were placed on the best available grades other things being equal. Stakes were set 100 feet apart and levels secured, after which side notes were taken and plotted on cross section paper,



MR. W. I. LEE
County Highway Engineer, Tazewell County, Virginia.

Paint Lick and Deskins are Buck Horn and East River Mountain and situated in the breaks thereof will be found the town of Tazewell.

Due to the altitude and topography the general drainage north is into the waters of the Big Sandy River, west into Clinch, south into Holston, and east into New River.

An election to determine if bonds were to be issued for road improvement was held on April 18th, 1911.

(due to the ruggedness of the country this was the way to secure a close estimate), areas and cubic yards being calculated and from this table 1, was constructed and the unit price selected for material excavated unclassified; these results were secured at a cost of \$40.53 per mile.

Reference to the table will demonstrate that the estimated cost is 85% greater than the amount of money available, consequently there must be a corresponding reduction of the mileage, or the work must be done at nearly 50% less than the prices assumed.

To determine if the figures assumed were approximately correct, it occurred to me to take the bids of seven different contractors and see how the average would compare with our results, and I found this developed an increase of 6 1/2% over the assumed prices. The bids referred to above were opened on February 13th, 1912 and rejected as being too high, though some of them were recommended for acceptance as reasonable. After bids were rejected it was decided to do

May 1912 without being properly organized, consequently the progress and cost was not satisfactory, developing dissatisfaction and a change of engineers, later a pro-rating of each district's money, so that each road in the call would secure its part. This separated the roads to be improved, into small sections, and especially those named for grading only, therefore organization was more difficult.

The system adopted will be noted by reference to the diagram, in which for each road plant, I have a superintendent, with all foremen and labor directly under him, and they are, with few exceptions capable of doing the construction engineering.

Instrument men are employed to set stakes and measure the work done by the grading forces, while the foremen in charge of the work report daily the time made to my office, where the time keeper tabulates it. All records are made in duplicate, by means of a system of blanks for their various purposes and at the end of the month combined with the pay roll. One of these for each road shows in the footings the total expenditures, and a copy thereof, with duplicates of all bills for material, are inclosed to the office of the State Highway Commissioner at Richmond, Va., where the same are checked and approved.

As drainage is a fundamental pre-requisite to the proper construction of all roads, and the more perfect its installation, the more the future cost of maintenance will be decreased, it has therefore received the attention it deserves. This matter consequently resolves itself into surface and sub-surface drainage. In the latter case the conditions existing here can be met by ditching across, or parallel to the road and filling to the top of grade with stone, decreasing in sizes to the top. The former however is of much more serious importance, and where accurate local information cannot be secured, Professor Talbot's formula for waterways has been used, and for convenience the data was calculated for various drainage areas in acres and square miles.

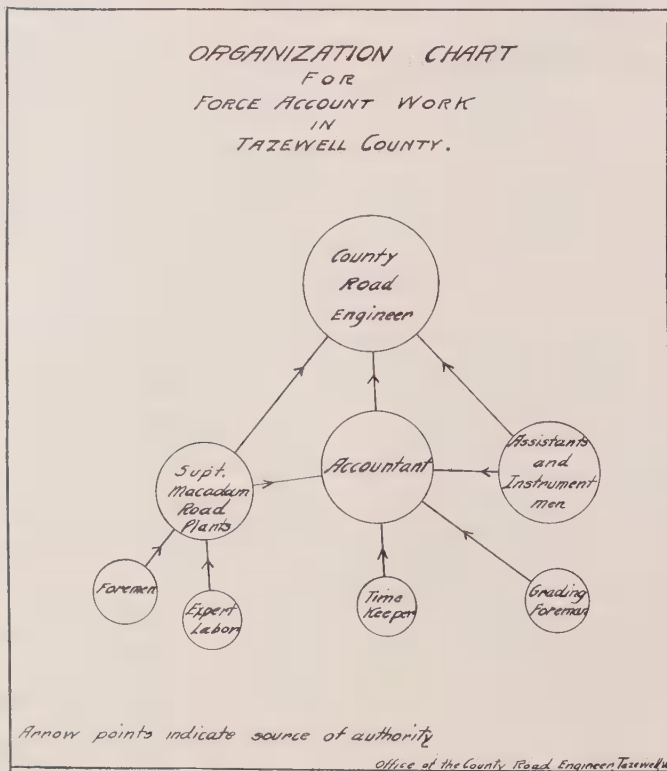
For small areas we have used double strength vitrified pipe.

Frequently however the height of fill will prevent the use of pipe sufficiently large, as experience has demonstrated that a cushion of good clay well tamped equal to the outside diameter thereof is essential.

To overcome this feature I have used a jacket of concrete.

This low headroom space for waterways giving trouble, a semi-circular concrete culvert and collapsible forms for same were designed; later a half circle galvanized ingot iron pipe came to be used where rapidity (see Fig. 3 B) came to be used where rapidity in construction was desirable.

For permanence however, the standard reinforced concrete slab plans of the Highway Commissioner for spans from 2 to 20 feet, (which allows latitude in the



the work by force account; therefore, seven portable macadam road plants were purchased with the intention of employing teams and labor locally, thereby anticipating a saving to the districts. The crushers are capable of turning out from 75 to 100 cubic yards of stone per ten hour day.

Work was begun with the road plants in April and

TABLE No 1																			
ESTIMATED COST OF CONSTRUCTING TAZEWELL COUNTY'S SYSTEM OF ROADS																			
Miles	Excavation Cubic Yards	Amount for Excavation Unit Price	Vitrified Pipe				Amount for Pipe	Cement Rubble Masonry	Dry Rubble	Concrete 1-2-4	Reinforcing Steel	Concrete 1-3-6	Rubble Paving	Amount for Grading and Drainage	Macadam Paving Spurs Amount	Total Amount	Roads to be Macadamized	Roads to be Graded and Crowned	Grand Totals
			12"	15"	18"	24"													
19.7	4389.08	279163.08					22730.00							32105.73	75288.7	37974.78	70202.61		
13.74	6913.97	410787.16					26313.10							65008.10			45005.18		
1853.1	1303.06	689740.92					49063.10							772104.91	751689	37974.78	1157020.79		
Below will be found an average of Seven Contractors Bids which is about 6 1/2% over that of the estimate																			
257.3	11303.06	718058.28					46665.96							707880.13			118455.00	1226078.61	

design of abutments, and ornamental features in the treatment of sidewalls) have been extremely satisfactory.

To reduce cost and facilitate the work, I have used gas pipe railing.

It is the purpose to plan all surface waterways below the grade line of the paved roads, but in some cases where conditions will allow water to be largely controlled I have used an open ford, paved with concrete or rubble, with substantial concrete curbs.

Due to the mountainous location of this county the excavation is largely rock, and in some cases will classify 90% solid, with the slope so steep that little of the quantities can be used for filling.

All of the pavements have been water bound macadam 9, 10 and 12 feet in width, rolled to six inches in thickness, built up in two courses with the screenings used for binding, crown of $\frac{3}{4}$ " on one foot, earth shoulders 1" on one foot.

Recently an exception has been made to the above, by placing on the road between the depot at North Tazewell and the town of Tazewell a bituminous macadam (penetration method.)

In this construction 2.11 gallons of material to the square yard, was used at a cost of $65\frac{1}{2}$ cents per square yard complete, and 5572 square yards was so treated. The material was applied from a tank under light steam pressure furnished from a road roller attached. The two spray nozzles are so arranged that the material being hot and in a liquid state takes the shape of a fan, and being supported about 18" from the surface covers an area of about fifteen inches in width, the hose carrier walking back and forth at

right angles to the center of the road. This is followed immediately by laborers applying stone chips, from which the dust has been screened. It is then rolled, the surplus broomed off, the seal coat is then applied, followed again by stone chips, a final rolling and the road then opened to traffic.

As before stated, it was decided to do the work by force account using teams and labor locally. This is a grievous mistake, as the periods suitable for stone laying are always during the cropping or harvest season, and there is little floating element in the county. Then again the close proximity to the coal fields produces a demand for labor unequal to the supply. Varied experience in charge of force account work, with close attention observing the execution and analyzing the results of the method convinces me, that the equipment must conform to the output desired, and there should be united, concentrated, systematic action for best results, and politics must be divorced therefrom.

I am firmly of the opinion that antedating any bond issue for road improvement, it should be mandatory to secure a traffic census, and from the data so collected, a classification developed proportional to their importance; with this ratio an economic distribution of the funds can be accomplished. One modifying influence should be observed however, namely, if the road under consideration, by reason of future developments is likely to become an intra-county, inter-county, or inter-state highway.

The work here will be completed in the year 1914, though it is expected to be discontinued during the severe winter months.



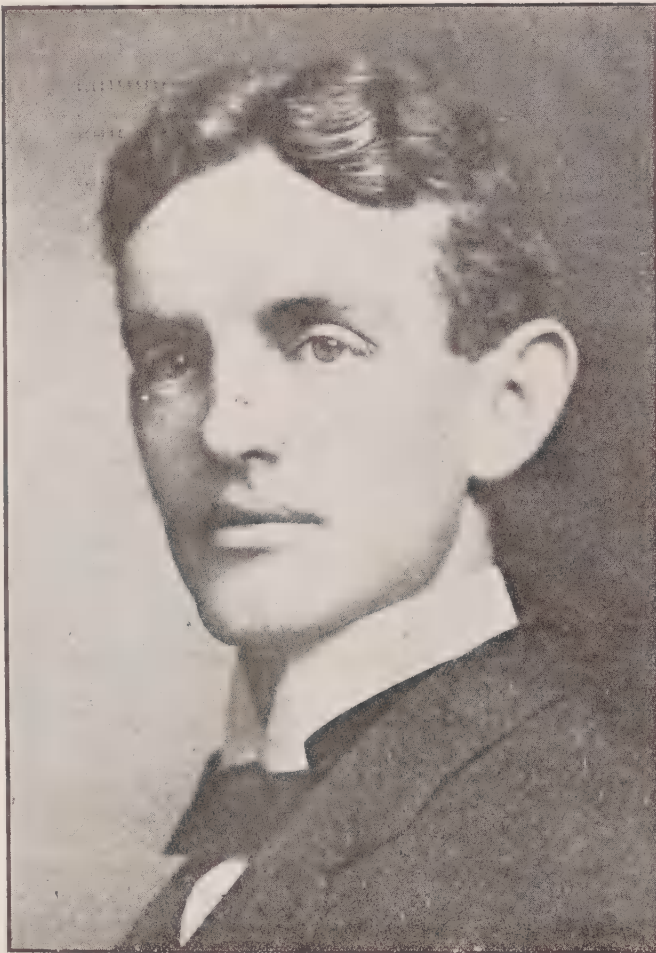
Bridge No. 1 across Plum Creek, Tazewell county, Va. Built of re-inforced concrete with gas-pipe railing. Note the rubble wall to the right built to prevent overflow of road beyond bridge by high water. See page 5.

The Relationship of Colleges and Universities to the Good Roads Movement

By **EDWARD K. GRAHAM**

Acting President, University of North Carolina

THE MOST obvious relation between what is called higher education and good roads is in furnishing adequate instruction in civil and highway engineering for students who wish to make road-building their profession. A second relation of a direct sort is in the expert engineering service college professors may render the communities in which they live. Both of these



DR. EDWARD K. GRAHAM
Acting President, University of North Carolina.

functions of instruction and leadership we have undertaken at the University of North Carolina and with gratifying results. We have a four year course in highway engineering that is attracting some of our best students. Between five and ten men are specializing now in this work, and those who have already been turned out have immediately "made good." Our professors are actively engaged in road construction in Orange county and in the state at large. It is our purpose to develop this department as rapidly as means are available along lines of wider service and efficiency.

But beyond this direct service in teaching and supervision there is a deeper relation that is more important. It furnishes the answer to the interesting ques-

tion as to why it is that colleges that used to exist to teach Greek, history, mathematics, Hebrew and the like to prospective ministers, teachers, lawyers, and doctors find themselves adding to the standard courses of the classical curriculum courses in road-building or whatever else our present civilization needs to know. The answer is simple. Education has come to see that the whole field of our present civilization is its field, and that it is the great co-operating agency in converting material forces into more productive and higher values. It has come to see that a sound physical and material life promotes a sound spiritual life, that we do not have to choose one and discard the other.

The good Samaritan did a religious act when he healed the physical wounds of the man by the road and then provided him with money to keep him in physical comfort.

Learning has not abandoned the high standards of its earlier days; it has abandoned its remoteness and mystery. It has come from its cloister to make its temple in the streets and on the roads where men dwell. The modern college has not lost any of the heights that the old college won; it is merely making those heights more accessible. We still believe that Homer and Shakespeare and the political science of Adam Smith and the binomial theorem are immensely important. We still believe that it is important to know the economic status of the ancient Roman. But we believe that it is more important to know the economic status of the present North Carolinian. Road-building, corporation-commissions, hookworm campaigns, rural credit systems, taxation adjustments, market facilities—all the hundreds of manifestations of our complex material life are necessarily a part of any education that is vital. It is the business of education and of all of the so-called higher interests to know every detail of the material life of North Carolina in order through sympathy and efficient co-operation to facilitate genuine progress. We will have poverty-stricken, disintegrating country churches if our religion does not take account of the present bread-and-butter life for everybody under a wise practical economy, as well as a happy future life for a few under an abstract theology. We will still rest oppressed at the bottom of the column of illiterates until we people who believe in good schools realize more actively that for the schools to be prosperous the people must be prosperous.

It is so with all the aspects of good citizenship. It is difficult to be a good citizen, and build a strong commonwealth on an empty stomach. Nor does such a statement magnify the function of the stomach. It is merely to say that the higher functions must see that the stomach is sound; that all those who are careful for the higher interests in the uplift of the state should remember that the material well-being of all of our people is a part of the ministry of us all. We need to see our state life as a unit and not as divided into banker against farmer, town against country, material against spiritual, but as a co-operative enterprise in making good impulses efficient and prosperous.

When we look at the facts of the condition of our

schools, our churches, our roads we are discouraged and wonder what can be the trouble. When we look at the facts of our yearly community surplus, on which these community enterprises are conducted, we see clearly enough what the trouble is. Dr. Bradford Knapp told the bankers in Asheville a few months ago that the people of North Carolina were sending \$39,640,885 out of the state every year for supplies that might have been raised at home. Secretary Leake Carraway of the Charlotte Club says the feed stuff imported into state for this year will amount to more than \$50,000,000. The farms of the state in 1909 created 209 millions dollars but the feed bill was 223 millions. In the words of Professor Branson who compiled these figures, the wealth-creating power of North Carolina and of the other southern states is enormous, but our wealth-holding power is feeble. We have produced in two and a half years more than we have accumulated on our tax books for two and a half centuries. It is on our yearly cash balance that all of our public enterprises depend for support.

There, then, is the problem for the good roads people, the good schools people, the good churches people: how can we make the community bank account more prosperous? We can make this question more concrete: how can we protect and promote the prosperity of the home of the productive man on the farm? For if we picture our southern civilization from any angle we choose, looking at it through the school, the church, the store, the railroad, we see as the saving grace of it the prosperous farm, tilled by its owner. There is the living heart of the matter. The civilization planted on a prosperous home-owned farm is like a tree planted by

rivers of water; planted on political and social economy that discourage and prevent ownership, its leaf and fruit will be withered and barren. None of our institutions will be prosperous if this productive farm is not safely prosperous and the facts tell us that it is not safely prosperous. Home ownership of our producing farms is decreasing instead of increasing. In 1880, 33% of the farmers in North Carolina were tenants; in 1890, 34%; in 1900, 41%; in 1910, 42%. Tenancy has left its black blight across civilization after civilization scorching spiritual as well as material life. Under tenancy the whole social scheme becomes unstable and falls into decay. Sir Horace Plunkett prime mover in restoring landless peasants to land-ownership and thereby redeeming Ireland, says of our farm tenancy system: 'It is the worst of which I have any knowledge in any country.'"

But I do not mean to discuss in any detail the question of farm tenancy. I merely mean to emphasize the fact that however material this and similar questions may seem to be on the surface, they are vitally related to every higher aspect of our civilization. We have enough good citizens in North Carolina and in our other southern states to solve this and all of the other complex problems of our rapidly expanding industrial life. In solving them, I have the temerity to believe that good citizenship will express itself in some form more statesmanlike than great philanthropic gifts to alleviate human poverty and crime. Better business and a truer citizenship and philanthropy are those that prevent poverty and crime rather than attempt to relieve them after they have been a party to their creation. Asylums and jails are more often a sign of bad



Governor Locke Craig, clad in overalls, shoveling dirt on the roads of Buncombe county. Several prominent citizens of Asheville are with him.



Governor Craig at the "Good Roads Barbecue" in Buncombe county, North Carolina, on November 6. The moving picture man has his camera leveled on the Governor. Several hundred feet of fine film are now going the circuits, showing North Carolina's "Good Roads Governor," in action.

civic economy than of deliberate sin and bad human motive. Education that goes with a plan of increased local tax in one hand should go with a plan of increased ability to pay in the other; Christian philanthropy that goes with a plan of salvation on one hand should go with a liberal land lease and credit system in the other. We need conferences on good roads for the good roads people, and conferences on good schools for the good schools people, and on good churches for the good churches people; but we need conferences for the common good by all of the good people in every county in every southern state to discover all the facts of our present civilization and their common relationship, and so develop the spirit of efficient and sympathetic co-operation that is the basis of the permanently progressive life we are all seeking.

A few days ago the newspapers pictured an incident that transfixed the attention of the world. A ship loaded with hundreds of human souls was burned at sea in a terrific storm at night. The shell of wood in the grip of fire and wind and wave and darkness and the precious freight it bore was a pitiable spectacle in its contest with the omnipotent forces that sought to destroy it. But the same power that rode in violence upon the storm had provided through the slow and painful civilization of the years the means of protection. The miraculous voice of the wireless called through the noise of wind and wave and assembled the sympathy and courage of the citizenship of the sea; it reached across miles of darkness and storm and found a representative of perfectly organized American business efficiency—the oil ship. And the annihilating war-

fare of the most terrific of natural forces was stilled into peace. Behind this dramatic spectacle we can see the spectacle of our civilization working out its salvation by the same processes, through the co-operation of the same forces: Knowledge taking account of material facts and using its facts to build to higher knowledge and joining with commerce, and faith and heroism, and brotherhood toward still higher power and the freedom and more abundant life that comes from learning the use and laws and ways of material forces.

This is what we call civilization. The thing that happened there on the sea makes up our every day life. The river slips by the town and runs to the sea, a muddy turbulent stream. Its force is caught and converted into usable power. It turns the factory wheels, lights the streets, lights the school and the home and the church. It is purified and cleans the town and gives it health. We have mastered the fact of it, its ways and its laws, and the turbulent stream is no longer mere material, undirected force it is spiritual life.

We call this process of mastering the ways and laws of material forces that they may lead to high and higher productivity, education. It knows no high and low.

That is why education is interested in the good road. It is an instrument of material progress. It is an open door to civic and spiritual expansion. It is an avenue at once of commerce and culture, an invitation to individual and community development. It leads everywhere and is symbol of all progress: "The road that leads in front of my door is the road that leads to the end of the world," and the wonderful fact is that for me it is the only road.

Roads and Their Insistent Users

By A. G. BATCHELDER

Chairman Executive Committee, A. A. A.

WHILE the commercial aspect of roads building in relation to the transport of produce from farm to market and merchandise from factory to consumer properly commands great consideration, the fact should not be overlooked that roads travel presents social advantages which are as essential to the development of a nation as is the accumulation of dollars. An intimate knowledge of a man's own state such as is gained by roads travel makes for the betterment of the citizenship generally. The man who visits adjoining states has brought to his attention the needs of other

variably been the case in the establishment of things which are revolutionary in their effect.

It is the automobile that has widened the scope of roads travel until now in the course of a day one may visit several states, while trips from town to town and county to county are commonplace. The most important advantages gained are commercial in character and this phase of the matter is one which is approaching astonishing proportions and carries with it an amplified demand for community and county roads, and continues to the need of inter-county and inter-state arteries of communication. Parcels post will attain its maximum development on roads of the first class. Rail roads will enter the field of motor trucking—are entering—and this will take care of short haul freight transport, which in most instances is now carried on at a loss. Continuous roads follow as a positive demand in connection with this new era of transport, town to city, county to county, and state to state.

Federal Aid.

That the national government can rightly insist before federal co-operation is given that the state shall do their proportionate share in the general roads improvement, will logically appeal to all fair-minded advocates of roads progress.

That states must establish state systems in charge of competent highway department is now an acknowledged roads need, in promoting state-wide development. Construction by the state of the principal inter-county roads is an essential.

When the call for national government participation is legislatively recognized, it will naturally relate to the interstate highways.

Since the state saves that which otherwise would be expended on these big roads, this money can be employed in perfecting its state system. Undoubtedly the average man in city and town and the man in the country are most concerned in the county market roads. Thus the national government could very properly impose an obligation to the effect that for every dollar spent on interstate commercial roads, the state must agree to spend a proportionate equal amount through its state highway department on the lateral and connecting market roads. This would insure those roads of value both to the farmer and the man who must have that which is raised on the farm.

Township roads as a whole must properly be a charge on the township; but out of every town system there will be at least one or more principal roads which become county in their use, and hence devolve wholly, or in part, on the county, and should be included in the county system. Invariably these roads lead to the county seat. In like manner, there would spring from these county roads, highways which are inter-county in their use, and hence should properly be taken over by the state.

Finally in every state from the state system there will emerge those trunk lines which connect the main arteries in adjoining states, or which lead to a seaboard shipping point, or touch the international border line. In the creation of this national system there would be due regard for centers of population.

Experience has shown the general undesirability of partnerships between nation and state, and there should



A. G. BATCHELDER

sections of the country, and inevitably his viewpoint assumes a national character.

Not a few states possess scenic attractions which ought to be reachable by road, and while it is true that, looked at entirely from a dollars-and-cents standpoint, some of these highways could not be considered commercially important, their building is essential in enabling one to enjoy that which has been supplied by the Creator. Hence, every road we construct should not be passed upon solely for business utility. A nation which interests itself, to the exclusion of everything else, in the accumulation of money, misses many of the better things of this life.

Simply because a few people preceded other people in the use of a time-saving, and now economical and widely used road vehicle, they were and are still designated as "motorists" and are looked upon as a special class, and subjected to unfair laws. Such has in

be no variation of this policy in highway matters. For the townships of a congressional district to expect from the national government that which is unobtainable from the state, is an untenable proposition. The roads

question concerns all four political subdivisions, and each has its part to do in the premises. Furthermore, if the lesser unit does not seek to help itself, how can it expect co-operation from the next succeeding unit?

Problems of Construction - Maintenance

By J. F. WITT

County Highway Engineer, Dallas, Texas

This paper will not attempt to go into details of road paving materials and cost, but the intent is to deal in a general way with those general conditions that confront every community that contemplates highway improvement.

The first thing to be done is to decide what roads should be improved, keeping in mind the fact that your roads will be a magnet, and they should be. The pleasure-riding public as well as trans-country and trans-state traffic, are always looking for the best highway. Keep in mind also the natural increase in traffic—these questions should be worked out before construction begins.

One may think there are only a few essentials to good road construction. But, preparing a proper subgrade, taking care of surface and subdrainage, thorough rolling, selection of material looking to future maintenance, etc., while not all by any means, are enough to demand close attention.

Just graveling or paving a road should be in the past. We must look to what material will best stand up under a specified traffic. Better not pave at all than use material unsuited to traffic requirements. The City Engineers of Fresno, Pasadena and Berkeley have made a report to the League of California Municipalities on the work of the State Highway Commission. It says the following:

"It is our opinion that where pavements are constructed at all they be constructed of a character which is known to the most durable, permanent and practicable under local conditions; this, of course, would mean that a smaller percentage of paved roads and a greater proportion of graded roads would be constructed. We feel that whatever work is done should be done with the end in view of securing the best pavement known to highway builders today, thus reducing to the smallest degree possible the factor of future cost of maintenance, for which, by the way, no specific provision has been made to our knowledge. We believe that even though some localities would have to be satisfied with an ordinary graded highway or perhaps an oil-surfaced highway under the present bond issue, this would be a far better course to pursue, not only for the reason that the best pavement is none too good, but for the further reason that when the bond issue is exhausted the commissioners could go before the people and claim that whatever work was done had been done according to the best-known construction and that the graded roads would be finished and could be used as subgrades for future pavements if the people should see their way clear to vote an additional bond issue."

A proper subgrade with proper drainage is the first essential, and this is very important, for this is the foundation and will last practically forever. Then select the best available material for paving, limits in kinds of paving being from gravel to asphaltic concrete or macadam.

Engineers are trying to solve the problem of a thin pavement, approximately seven to nine inches in depth.

Results to date are not thoroughly satisfactory. Bitulithic is real good, but all patented pavements are not bitulithic. So it is better to know what you want, then prepare your own specifications. Owning of patents and specifications gives promoters of the same too much advantage, practically eliminates competition in bidding for the work on account of the prepared specifications or any specifications, for that matter, having certain clauses that should be left to unbiased authority. Besides, all communities have beneficial conditions that enter into the proposition.

The automobile is here to stay, so let's be reasonable and provide a pavement that will stand up. The wear from automobile traffic has entirely changed old paving methods and the heavy motor truck has accelerated the change. But considering the automobile from all angles, we find much more on the side of progress and a general toning up of social and commercial conditions than we can possibly find on the reverse side. Therefore, after studying all traffic demands and other conditions the wisest course to pursue is to construct in keeping up with the traffic demands, remembering at all times future maintenance.

Maintenance should enter into the original construction, and can if work is properly done. Maintenance should be constant. If the highway is constructed in keeping with the traffic demands the annual maintenance cost will approximate 8 per cent of the original cost. This per cent will, however, vary. Raise the standard of improvement in keeping with the natural increased traffic demands.

A road should be sectionized in keeping with traffic conditions and provided with road keepers. It is well to have joint discussions between governing boards, supervisor and road keepers, say every three months. These meetings could not help but do good. For instance, I have known men to run good drafts for some time without knowing how or when to use them and without any knowledge of required crowns to give sur plus surface drainage, etc.

In conclusion, let me say just a word along another line. Bond money for highway improvements is often considered too lightly. We must remember that this money has to be paid back the same as any other bond money. The money expended is too valuable to be wasted, and highway improvements are too valuable to be lightly dealt with. It doesn't take many mistakes to reduce the value to 50c. on the dollar, while a loss of 25 per cent is a common occurrence. Let's reduce this to the best efforts of man and we will have done our best, which is certainly all that could be asked.

Ginter Park, Richmond, Virginia, is asking for bids on street improvements including 20,000 square yards of sheet asphalt, bitulithic, or asphaltic concrete on a concrete foundation; 15,000 linear feet of concrete curb and gutter; 50,000 square yards of macadam resurface, and other street work.

Modern Road Construction in the U. S.

By MAJOR W. W. CROSBY

Chief Engineer Maryland Geological Survey, and Consulting Engineer, Baltimore, Md.

SINCE 1894, when the states of Massachusetts and New Jersey began their modern road construction, the development of such work in this country has been rapid. New Jersey had first provided for State Aid in highway improvement by an act passed in 1891, but this was inoperative from various causes until June, 1894, when work was begun. Connecticut began in 1895, Maryland, in 1896; New York, in 1898; and other states have followed from time to time until now, when over thirty are engaged in this work.

When the work began in this country, skilled highway engineers were scarce. M'Adam quite naturally was the "Mentor" of the engineers attempting highway work—his predecessors Tresaguet and Telford being overlooked.

The Massachusetts authorities seemed to comprehend, perhaps most clearly, the principles laid down by M'Adam and all their work has been based on these axioms. Of course, differing conditions, new machinery and varying requirements compelled some changes in the application of the principles, but the latter were as closely adhered to as possible under the conditions. The results show plainly that Massachusetts was particularly fortunate not only in the broad-mindedness, and farsightedness of her men in charge of the work, but also in the clearness with which they understood

the principles at the bottom of macadam construction.

As the extent of the work increased, the highway engineering branch of the profession developed. The ranks were recruited from young, energetic and ambitious members, the opportunities afforded being attractive to such men. Consequently, to-day some of the brightest engineers are following it and their work is leading the world.

The earlier highway engineers came in the main from those previously employed on steam railroad work, which work had reached here a development far ahead of that in any other country, and very naturally many of the details of highway construction were worked out according to railway ideas. For instance, in grading a road anew, the inclination was to establish long tangents and easy vertical curves in the profile, and with as far as possible an absolute avoidance of reverse curves in both the profile and the plan. Undoubtedly the results so secured were good but it is doubtful if they were always worth the cost, and unquestionably the following of such a program did result in many cases in an unnecessary disturbance of local conditions, and in friction with adjacent property owners. Later, as a better appreciation of the greater flexibility of the vehicles travelling a highway over those using the railway has been had, as well as the increased necessity



Showing Bridge No. 2 across Plum Creek, Tazewell county, Va., built under the supervision of Mr. W. I. Lee. See page 5

for economy, wherever possible to off-set as far as might be the higher cost of other details, has appeared, highway engineers have been modifying somewhat the rigidity of their earlier ideas regarding the grades. It is no longer considered bad practice to adjust the new grades to meet, as far as practicable, the topography of the country traversed, but rather the contrary. The "humping" of a grade over a culvert or bridge is no longer considered objectionable, provided an appreciable saving can be made in the cost of grading, and the changes in grade are not too abrupt for modern traffic. On the other hand, rough and raw "railroad cuts and fills" with barely sufficient slopes are now frowned upon by all, and considerable effort is made to increase, by proper sloping and planting, the attractiveness as well as safety of the slopes.

In the matter of culverts and bridges, it was early recognized that the more permanent forms of construction were the more desirable from every point of view. At that time, reinforced concrete was scarcely known here. The attempt was made to use brick and stone masonry as far as possible, though considerable steel work seemed necessary in most cases of over four feet span, owing to the cost of masonry arches. With the advent of reinforced concrete, the ability of the engineers to still further reduce the use of perishable steel truss and girders was greatly increased and the opportunity was immediately seized.

At first, in the use of concrete, too little thought was given to the appearances of such structures. As their permanency impressed itself, and with the growing appreciation of the value of considering the aesthetic side of highway work, much improvement in the design of such structures has resulted. There is room, however, for further improvement and the engineers of this country would do well to study the examples set in this matter by the foreign authorities.

In this study, there should be no cause for discouragement. The states are now trying to accomplish even more in one-fourth the time than foreign countries have accomplished in a century. The magnitude of the field of operations here, the necessity for haste, the meagreness of funds for the immense work, and the deplorable lack, until recently at least, of a proper general appreciation of the value of modern roads by the public generally, offer an explanation, if not an excuse, for the present backwardness of the states, as a whole, on this question. Many other causes or factors might be cited, but suffice it to say that, while this country is behind in results at the present time, the prospect is clear that it will not remain so long.

As regards the highway engineers themselves, the writer firmly believes that while, as referred to above, some of their practices are not up to the best foreign ideas, in some others the American highway engineers are far ahead of the rest of the world.

In the matter of road surface construction, the best practice in the states is away in advance of the foreign. In the variety of materials used, in the development of methods for using the same, and in the recognition of the proper principles to be followed, the engineers of the states can give points to the foreign engineers. So far as the writer knows, there is but one item of construction on which we should pattern after foreign practice, and that is in the use of machinery.

Owing to the diversity of our resources and conditions, the American road surfaces built offer an immense variety of results. By no means, all of them are satisfactory nor, undoubtedly, the best that could have been obtained by better methods. But the variety of materials and conditions has probably, in the short

period of their use, interfered with, in many cases, a proper recognition of the best methods of use. Unwise conservation and adherence to old practice, as well as rash and unjustifiable ignoring of well established principles, have been naturally followed by failures or unsatisfactory results. The advent of a new material for use on the roads, or the conception of a new method, perhaps induced by local conditions, has too often tempted highway authorities, and even the younger highway engineers to ignore or abandon the proved principles underlying such work, and to "rush after false gods" to their own (or others') destruction.

As stone macadam forms the greater part of modern road surfaces, in expatiating somewhat on the above, it will probably be well to do so on that form of surfacing and briefly refer afterward to the others.

Stone, broken by hand or by machinery, is probably the oldest and most universal of road surfacing materials. Certain well developed principles have been established, concerning its use in macadam that ought to be so well recognized that their repetition would be trite and unnecessary. The writer regrets that such does not seem the case and therefore feels impelled to state as follows:

a. The macadam surfacing is but a roof, a wearing surface over the foundation, without which latter it cannot support a load nor in which can it remedy defects of sustaining power. It is true that to some extent the macadam may effect a distribution over the foundation of the strains coming on the surface of the former, but in the design of the foundation, great care should be had in allowing for such distribution.

b. The macadam should be planned as, and built, separate and distinct from the foundation. Any merging or lack of distinctness between the two, except possibly in the cases of sandy or sand-gravelly foundations, can only result in a weakening of the macadam without a corresponding increase in the strength of the foundation.

c. The particles forming the macadam itself should be packed as closely as possible together. There should be an actual interlocking of the pieces of stone. No macadam is worthy of the name that does not contain this interlocking and the more perfect the latter is the better will be the macadam. This necessarily means that, in the laying of the macadam, screening to prevent improper proportions or too great variation in the sizes of the pieces being used is required, as are also the spreading and compacting of the stone in layers of only such thickness as the roller can be relied upon to compact to the utmost; the exclusion of such an excess of fine or foreign material from the mass of broken stone as will prevent the proper compaction of the latter; the reduction of the voids in the mass of broken stone to the utmost possible minimum, and the after filling of those voids by finer material to complete the compaction of the mass.

Only too often has the writer noticed in this country the ignoring of one or more of the principles expressed in the above paragraphs, but he has been impressed with the far more prevalent ignoring of them elsewhere, especially those principles mentioned under "c." Good results, where these latter have been ignored, are evidently not worse only because of the maintenance accorded after construction. That the cost of such maintenance could be materially reduced or that better results with the same maintenance could be secured by recognizing the principles mentioned has apparently been lost sight of, with the principles themselves, by the foreign engineers. No one who has the opportunity to examine carefully the foreign construction of road

surfaces can fail to be impressed with its inferiority compared with that of the best of the states—as it has been styled “the McClintock Road.”

The writer has been regretfully impressed with an apparent tendency, more especially perhaps among novices in road building and with suggested new materials to ignore in their work the points referred to above. For instance, with the use of pitch compounds (bituminous cements) in road surfacing, some sort of results can be secured even if the stone is not thoroughly compacted. Usually, however, as the more experienced engineer fully realizes, the absence of the proper interlocking quickly makes itself manifest—especially in cases where a short lived cement has been used—and such a surface readily succumbs to severe strains. It, of course, takes some time frequently to demonstrate the expensiveness of inferior construction and by that time often the same authorities as were responsible for such construction are chasing new butterflies.

Much might be written concerning the details of ordinary macadam work but the discussion while interesting perhaps would largely resolve itself into consideration for local conditions. For instance, the ideal macadam is built of proper trap rock with an utter absence of anything in the shape of clay or earth. Many engineers prefer for convenience in some way to add clay or similar material for the “binder.” The writer is fully aware of all the discussion that has been had on this point but retains his conviction that such a practice is only a makeshift and is not justified in principle.

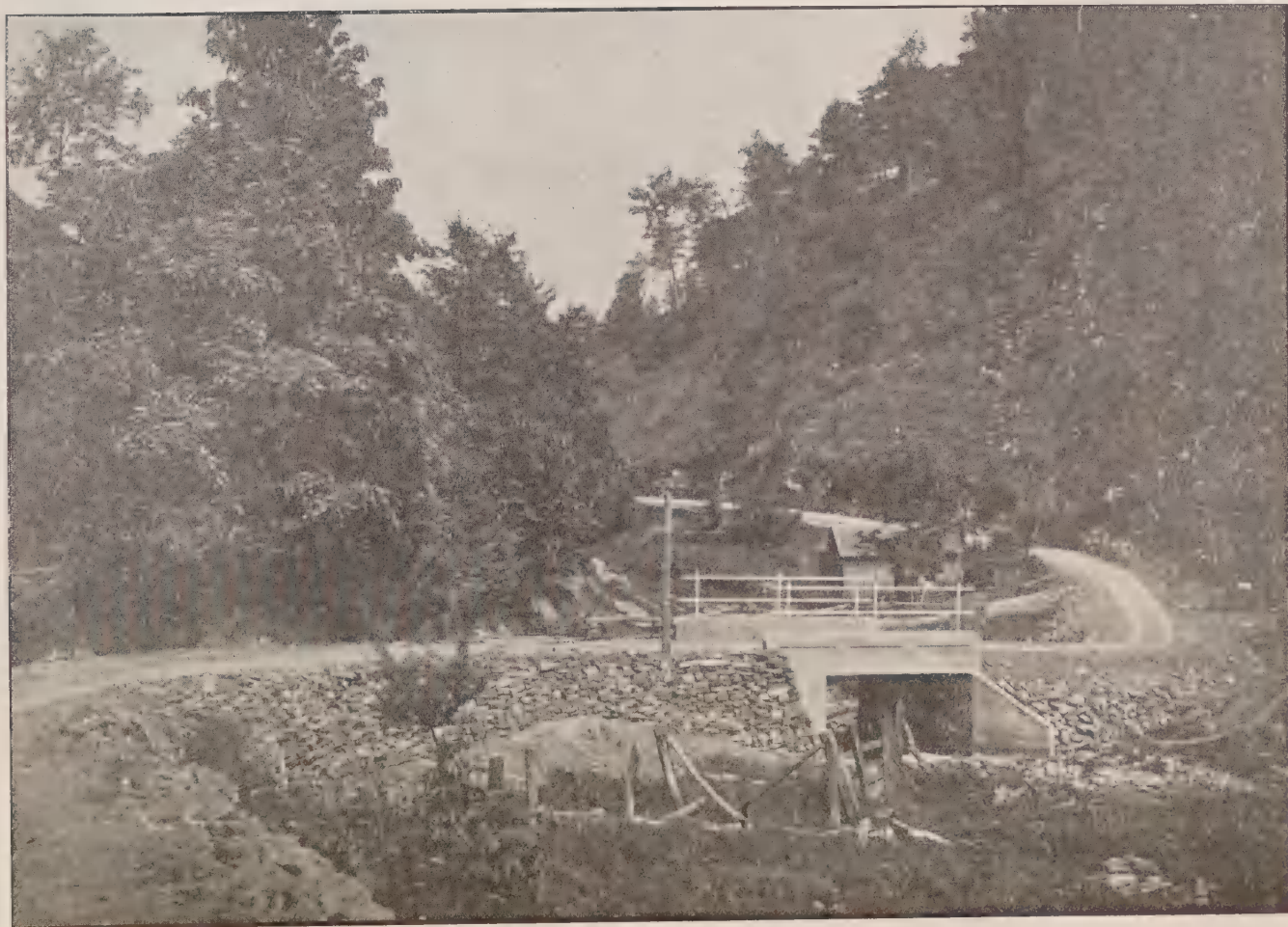
Some localities are devoid of trap and local conditions may seem to compel the use of even a soft lime

stone. Undoubtedly this makes a better macadam than many other local stones and its results may be improved by “reversing” the courses, i. e. by using the No. 2’s in the first course and the No. 1’s in the second course as laid. The results, however, are even then usually inferior to those of the ordinary methods using suitable stone, though the “reversed” macadam may be a locally satisfactory and indeed necessary, makeshift.

The writer has even “reversed” excellent trap rock, where severe traffic conditions seemed to call for such a procedure with satisfactory results by the addition of a bituminous cement. The main objections to a “reversed” macadam are a resulting excessive roughness of surface in ordinary water bound work, and a tendency of the macadam to ravel. Both of these can be largely overcome by the use of a suitable pitch in the surface. This reversal of the courses seems to violate another principle of ordinary macadam, namely:

d. The sizes of the pieces of stone forming a course of macadam should be as large as practicable and, at the same time, no larger than will retain their position in the completed road despite the ordinary tendencies to dislodgement. The presence of a proper binder may justify the apparent violation.

M’Adam found that a one inch cube was about the maximum that could be relied upon to retain its position in the road surface under the tilting tendencies of the loads and with the support of the adjacent pieces interlocked with it. It has, in our modern work, been demonstrated that the cementing action of the stone dust may aid the interlocking somewhat and under certain circumstances considerably. In some cases even as large as the “3-in.-size” of soft limestones have done



Bridge No. 3 across Plum Creek in Tazewell county, Virginia, on a beautiful stretch of macadam road.

well in the surface of the road because of their high-cementing qualities. In fact, in any macadam, it seemed desirable to use a stone whose dust has at least a certain cementing value (a makeshift is the addition of clay, before referred to.) Especially is this true under modern traffic.

Page has shown that the cementing powers of many rocks can be greatly increased by the use of limestone screenings with them and this has greatly increased the number of available stones. There are many localities, however, where suitable stone is not available and local conditions require substitutes of various kinds for macadam. Among such may be mentioned gravel, shells, marl, burnt clay, slag, coquina, etc. To the use of these, the principles of ordinary macadam operate in full. The application of these principles has not been as generally careful as might be wished. For instance, in the use of shells, frequently too much reliance has been placed on the mortar formed by the sand and shell dust to hold the shells themselves in place, and not enough compaction has been secured in the shells themselves to secure the best results from them.

In many instances, local conditions have caused the abandonment of macadam entirely and instead, the use of block pavements, such as brick, or sheet pavements, such as asphalt mixtures, sand clay, etc. Home experiments also have been tried with small blocks of both natural and artificial stone. While undoubtedly the variety of experiments has been much greater in this country, it cannot yet be said that all have been successes. Nor have all been failures by any means. There is much hope for ultimate success in perhaps the majority of cases.

For the greater part of the modern highway work in this country, "macadam" can still be considered as a standard surfacing. The writer does not consider that macadam loses its character as such by the mere substitution of a bituminous cement for the mineral colloidal cement of earlier results. When, however, the before mentioned principles of macadam are ignored, especially the one concerning the interlocking of the pieces of stone, he believes the resulting mass is no longer entitled to be called macadam. Perhaps "bituminous concrete" would apply to such a mass, whose main reliance for integrity under stress may then come from bituminous cement in the mass. If the cement happens to be and remain a strong one, the results may be satisfactory and perhaps even more so than the best ordinary macadam could provide under the conditions. But they cannot ipse facto be as good even then as if the mass were a real macadam reinforced by the addition of bitumen to its interstices. The writer believes that the truth of the above will soon be more widely recognized than it is at present perhaps, and that instead of it being considered that "the macadam road is a thing of the past" it will be acknowledged that properly built and cemented macadam has a greater future than ever before. In fact, until recently vitrified brick, sheet asphalt and some other pavements were largely used to fill in the gap between ordinary macadam and stone blocks. With the development of a standard bituminous macadam, their use is constantly becoming more limited and dependent upon favoring local conditions.

Page has shown the horizontally shearing effect of the traffic so fatal to the life of ordinary macadam and it was quickly seen by engineers that successful resistance to such shear could be in many cases given to macadam by the addition of some form of bituminous cement. As a corollary, it was also quickly apparent

that the supply of available materials for use in macadam was contemporaneously enlarged—another factor tending toward an increase in the use of macadam strengthened by a bituminous cement. In short, the writer believes that the use of macadam properly treated to meet the conditions should be and is on the increase instead of passing away.

The fact that under certain conditions the existence of a thin carpet of pitch and sand over the surface of the macadam seems desirable, in no way lessens the requirements of proper macadam underneath, and the desirability for such a carpet generally is as yet by no means satisfactorily proved. However, it may be expected that valuable evidence will be forthcoming on this, as well as on numerous other points now in question, in the near future, and in the production of such evidence again, the engineers of this country are leading by months, if not years. The "standardization"



2-70' Truss Spans and 2-34' Beam Spans across Clinch River, near Cedar Bluff, Va.

pleaded for by a prominent English engineer in the spring of 1910 was actually begun a year earlier in the United States. Such standardization is undoubtedly the now most pressing consideration for us. We are at work upon the question in advance of the rest of the world and will undoubtedly soon accomplish conclusions of benefit to all.

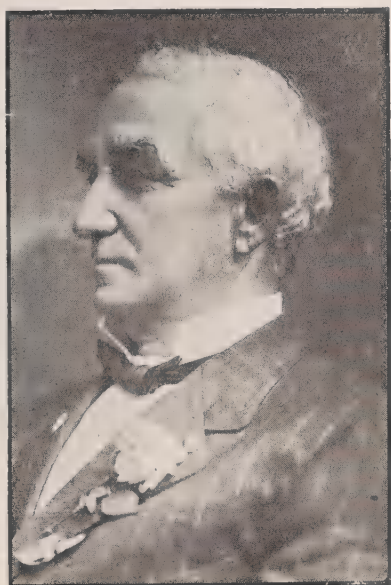
Highway engineering is no longer the work of a skillful, if ignorant, laborer. It has become an intricate art based on a science calling for deep thought and high skill to meet successfully the demands on its followers. The engineers of this country have above all others responded successfully to these demands and in greater variety and profusion of results. They have fallen behind on one point alone. We have not, as a whole, as yet, be it from lack of sufficient demand and opportunity, be it from lack of popular appreciation and support; or from even lack in ourselves of proper recognition of our duty, developed a system of maintenance—a regard for maintenance approaching the foreign or beginning to meet our needs. But "Maintenance" is a subject worthy of consideration by itself.

F. Z. Bishop, of Bishop, Texas, who is engaged in developing lands in that section for farming purposes, is building good roads on all four sides of the sections of land he is offering. Recently 12 miles of road in one straight stretch was opened for travel. They are 40 feet wide, ditched and crowned and have good bridges. He is finding no trouble in disposing of his farming lands with every farm offered surrounded by a good road.

Annual Convention Alabama Good Roads Association

The Alabama Good Roads Association held its annual convention in Mobile November 20, 21 and 22. There were 800 registered delegates, representing every county in the state and every town of importance. There were many visitors from all parts of the state and citizens of Mobile attended the meetings in large numbers.

There were three meetings on the first day. The morning session was called to order promptly at 10 o'clock by Hon. John Craft, president, and formal addresses of welcome and responses thereto, followed. Hon. P. J. Lyons, mayor, delivered the address of welcome for the city of Mobile; Hon. S. P. Galliard for



HON. JOHN CRAFT, Mobile, Ala.
President Alabama Good Roads Association.

the county commissioners and Mr. William H. Ambrecht for the Mobile Chamber of Commerce. Col. Gardner Green, of Pell City, Ala., made the response on behalf of the Alabama Good Roads Association.

Governor O'Neal delivered a strong address, following which came the annual address of President Craft and the annual report of Secretary J. A. Rountree.

There were interesting and instructive sessions in the afternoon and at night. Senator John H. Bankhead's address being the biggest feature of the night session.

Friday morning, the 21st, there was a most unusual scene on the stage of the convention hall. Alabama is approaching a gubernatorial campaign and there before the people of Alabama appeared the five avowed candidates for the place. In ten minute talks these gentlemen outlined to the convention the policy that each would follow if elected governor. These gentlemen, Messrs. B. B. Comer, Walter D. Seed, Charles Henderson, R. F. Kolb, John Wallace and T. E. Kilby, made interesting talks, pledging themselves to the policies advocated by the Alabama Good Roads Association.

Hon. R. E. Spraggins, president of the Alabama state highway commission, and Mr. W. S. Keller, state

highway engineer, outlined the work accomplished by the commission and its plans for the future and there were a number of other interesting features of the Friday morning session, including an address by Congressman John L. Burnett. After the morning session the delegates were carried to Monroe Park where they enjoyed a great clam chowder and oyster roast.

The Friday night program was featured by an address by Hon. Oscar W. Underwood, democratic floor leader in the House of Representatives, an address by Governor Brewer, of Mississippi, and other strong speeches. Part of the time was taken up in reports of committees and other routine work.

The Saturday morning session, which marked the closing of the convention, did not lose in interest by reason of its being the end. The delegates remained for the morning exercises and there was a general experience meeting, following the opening of the "Question Box," that did a great deal of good. The speakers of Saturday morning were: Prof. G. N. Mitcham, Congressman Sisson, of Mississippi, Congressman Blackmon, of Alabama, Congressman Dent, of Alabama, Congressman Aswell, of Louisiana, Congressman Stephens, of Mississippi, Mr. Solon Jacobs and Judge Dan Green, of Birmingham, and others.

Saturday afternoon, following adjournment, the delegates were given an automobile ride over the good roads of Mobile county.

The association adopted strong resolutions, in pursuance of the plans outlined in the annual address of President Craft, who recommended that the state should substantially finance road work in the state by providing a state bond issue to help the poorer counties of the state that are not able to build and maintain high class trunk roads.

Other features of Mr. Craft's address which met with instant favor on the part of the assembled delegates, were the following:

That there should be enacted into law a provision to maintain the roads that are constructed by the state; that this maintenance fund should be raised by placing a property tax on automobiles, a license tax on automobiles and a special tax on each citizen of the state between the ages of 18 and 45, of \$5 per annum.

That all convicts should be put to work on the roads of Alabama under the supervision of the State Highway Commission.

That the convention should go on record as favoring Senate Bill No. 3113, known as the Bankhead bill for national aid in road-building.

By authority of a resolution directing the president to appoint a committee to suggest a plan of reorganization, and confer with committees from the American Highways Association and the United States Good Roads Association with the view of amalgamating the organizations or suggesting a plan of closer co-operation, President Craft made the following appointments:

John B. Wilson of Demopolis; John A. Rogers, of Gainesville; John W. O'Neill of Birmingham; J. W. Shepherd of Jasper; J. A. Wilkerson of Eufaula; John Craft of Mobile, ex officio, chairman.

A resolution was unanimously adopted requesting the Alabama delegation in congress to recommend the

appointment of W. S. Keller to the national highway commission in the event of the passage of Senator Bankhead's bill creating such a commission.

Montgomery captured next year's convention of the Alabama Good Roads Association in the closing hours of the convention Saturday. A resolution introduced by John W. O'Neill of Birmingham, directing the executive committee to select Montgomery, was adopted after Bruce Kennedy of the Capital City had extended an eloquent invitation.

The report of the committee of nominations, which was unanimously adopted, carried with it the election of Capt. John Craft of Mobile, as president of the association again, and the re-election of most of the other officers. The following are the officers for the ensuing year:

John Craft, of Mobile, president; J. A. Rountree, of Birmingham, secretary; John W. O'Neill, of Birmingham; W. E. Skeggs of Decatur; Senator John H. Bankhead of Jasper and Hon. O. W. Underwood of Birmingham, vice-presidents at large. District presidents: First, J. D. Bloch of Mobile; second, Judge F. J. Dean of Evergreen; third, J. D. Lyons of Opelika; fourth, E. B. Deason of Clanton; fifth, C. E. Thomas of Prattville; sixth, M. D. Jemison of Tuscaloosa; seventh, Gardner Green of Pell City; eighth, J. E. Pierce of Huntsville; ninth, L. H. Pennington of Birmingham.

The executive committee follows: State at large—Hugh McGeever of Birmingham; John A. Rogers of Gainesville; H. K. Milner of Birmingham; Charles B. Hervey of Mobile; J. W. Shepherd of Jasper; Robert Moulthrop of Eufaula. By districts—First, W. H. Monk, Jr., of Mobile and H. W. Cochran, of Toinette; second, P. J. Cooney of Foley and Robert M. Jones of Montgomery; third, G. N. Mitcham of Auburn and W. H. Morris of Geneva; fourth, V. B. Atkins of Selma and F. A. Gullledge of Verbena; fifth, J. W. Overton of Wedowee and J. A. Wilkerson of Prattville; sixth, Walter D. Seed of Tuscaloosa and Richmond P. Hobson of Greensboro; seventh, J. Gassier of Russellville and W. D. Brown of Ragland; eighth, G. A. Nelson of Decatur and R. S. Pettus of Huntsville; ninth, Dan Green of Birmingham and J. F. Kelton of Oneonta.

The commissioners of Forsyth and Yadkin counties, North Carolina, are considering the building of a bridge across the Yadkin river at a cost of \$25,000.



Showing method of applying bituminous binder on road between Tazewell and North Tazewell, Va. See page 5.

A New Kind of Road Roller.

A new roller for use on asphalt, brick and tarred pavements has been placed on the market by the Austin-Western Road Machinery Co., of Chicago, Ill. It was placed on exhibition for the first time at the American Road Congress at Detroit in October and it attracted a great deal of attention among the practical road builders and paving contractors there assembled.

The manufacturers claim that the machine, which is called the "Austin Tandem Motor Road Roller," embodies many improvements over the steam style of tandem. They say:

"It runs steadier, has an easier and smoother reverse, is fitted with two gear speeds, and power steering device, the latter giving the operator better control



The Austin 5-Ton Tandem Road Roller in Action.

than power steer on a steam machine. In rolling, the machine does better work, by reason of its weight being hung lower, the top heaviness of the vertical boiler on the steam roller, causing a side sway and oscillation, which our machine has done away with. The operator on our tandem gets a better view, not having the boiler in his way, and he can see his work better sitting down than he can on the steam machine, standing up."

The photograph on this page shows a 5-ton machine, the first to be placed on the market. A 6-ton roller is ready for the market now and 7 and 8-ton machines will be ready immediately after the new year. This roller is the result of three years of careful work by experts and it is confidently expected that it will be a winner from the very start.

Knox county, Tennessee, and the Southern Railway Co., will construct a bridge in the outskirts of Knoxville at a cost of about \$40,000, the county paying \$12,000 and the railroad the remainder.

The Wood Drill Works, of Paterson, N. J., makers of the famous Wood Rock Drills, have just issued a new catalogue of their products and it is up to the well-known Wood standard. It is a very handsome piece of printing and it is an admirable exposition of the merits of the rock drill that can be "cleaned up with a sledge hammer" and "wiped off with a scoop shovel" and yet "stay with you." Persons interested in rock drills should write for this very fine piece of rock drill literature.

The bridge commissioners of Jefferson county, Arkansas, have contracted for the construction of a bridge across the Arkansas river at a cost of \$625,000.

A. A. A. Again Declares For Federal Aid

The American Automobile Association at its annual meeting just held in Richmond, Va., declared unequivocally that federal participation in highways improvement should be expressed so as to obligate the several states to expend upon their market roads directly serving the farming population a sum proportionate to the national expenditure on the most used commercial roads connecting the several states. It is the contention of the automobilists that the betterment of main and lateral roads shall be carried forward jointly in order to accommodate adequately increasing traffic needs.

John A. Wilson, of the Pennsylvania Motor Federation, was elected to the presidency, succeeding Laurens Enos of New York, who declined a second term. Mr. Wilson's long experience in automobile organization affairs guarantees an active administration of the National body. Dr. H. M. Rowe, of the Automobile Club of Maryland, of which state association he has been the head for the past five years, was advanced to the first vice presidency; R. W. Smith of Colorado was named as second vice president; F. L. Baker of California, third vice president; H. J. Clark of Minnesota, 4th vice president; and Preston Belvin of Virginia, fifth vice president. John N. Brooks of Connecticut continues as secretary, H. A. Bonnell of New Jersey as treasurer; and A. G. Batchelder as chairman of the executive board.

In the appointment of board chairmen, President Wilson named the following: Good Roads, George C. Diehl, New York; Legislative, C. C. Janes, Ohio; Touring, Howard Longstreth, Pennsylvania; Contests, William Schimpf, New York. The executive board contains members from practically every state.

Emphatic endorsement was given to the Adamson measure, which provides that after the automobile owner has registered his car in his own state he shall be privileged to go anywhere in the United States without additional registration. For many years the A. A. A. has sought federal registration of automobiles, but the bill put forward by Representative Adamson, of Georgia, exactly meets the needs of the situation, and it will enlist the unanimous support of all users of self-propelled vehicles.

Complimenting Secretary of the Interior Lane for his commendable work of making the national parks more available to road travelers, the association also placed itself on record as favoring increased federal appropriations for the national recreation regions, and pledged co-operation with the American Civic Association in its movement for a Bureau of National Parks.

The meeting adopted comprehensive "Rules of the Road and Regulations of Road Traffic," which will be generally advocated throughout the entire country. These rules also refer to pedestrians in their use of the roads, and this feature will command universal interest, for it is generally recognized that the increased use of the highway makes absolutely necessary regulations covering pedestrians as well as vehicles.

In reference to the registration of automobiles, the association hereafter will be opposed to a registration

tax unless same shall be in lieu of all other taxes, and the money thus raised expended in connection with roads maintenance. The so-called New Jersey test case, involving both a substantial registration tax and a personal property tax, has been taken to the U. S. supreme court and will be pressed with all due speed to its ultimate determination. This case originated during the occupancy of the A. A. A. presidency by Robert P. Hooper, who is serving his seventh term as the chief executive of the Pennsylvania body.

Upon the invitation of President L. R. Speare of the Massachusetts state association, the next annual meeting will be held in Boston. Since the 1912 gathering was in the west, the 1913 meeting in the south, and the next gathering in the east, in 1915 the association will again visit the western section of the country.

One of the best descriptive writers in the United States and an engineer of national reputation will start from San Diego, Cal., this month to cover the route of the Southern National Highway, according to a telegram received by Col. Ed Fletcher, president of the San Diego Good Roads Association, San Diego, Cal., from Dell M. Potter, president of the Southern National Highway Association.

Mr. Potter wired Colonel Fletcher that he had closed a contract with Harper Brothers to publish two hundred and fifty thousand magazines containing a write-up of the resources, the scenic beauties, the climatic conditions and all the other things that will attract the tourist and investor to parts of the country through which the Southern National Highway passes.

These magazines are to be mailed principally to people in the northern and central parts of the United States.

The plan is to have the highway go direct from San Diego to El Centro, thence to Phoenix Arizona and on



Prominent Lexington (N. C.) Citizens Taking Part in the Work on Good Roads Days, Nov. 5th and 6th

through the south following the route recently traversed by the scout car. As it is estimated that each copy of the magazine will be read by an average of at least eight persons, millions will learn of the wonders of the south through the medium of these magazines.



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LEXINGTON, NORTH CAROLINA

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Official Organ of the North Carolina Good Roads Association

HENRY B. VARNER, President, Lexington, N. C.
 DR. JOSEPH HYDE PRATT, Secretary, Chapel Hill, N. C.

Official Organ Southern Appalachian Good Roads Association

DR. JOSEPH HYDE PRATT, President, Chapel Hill, N. C.
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Official Organ of the Virginia Road Builders' Association

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VOL. VIII.

DECEMBER, 1913.

No. 6.

W. W. FINLEY.

W. W. Finley, vice president of the American Highway Association and president of the Southern Railway Company, died at his home in Washington last month. He had been in apparent good health almost to the very moment of death, and his sudden passing was a great shock to his many thousands of friends and admirers throughout the south.

Mr. Finley was one of the leading good roads advocates of the nation. He took an active part in the organization of the American Highway Association and gave much of his time to directing its work. At the time of his death he was vice president of the association and no man connected with it was more interested in its growth and development than he.

Mr. Finley's last great public speech was made at Asheville at the annual convention of the Southern Appalachian Good Roads Association, October 22. His address on that occasion was published in Southern Good Roads last month. The readers of this magazine are familiar with his position on the various problems confronting the good roads movement, for he has been

a regular contributor to its pages since it was founded in 1910.

Mr. Finley will be greatly missed. Few men of the past decade have done as much for the general advancement of the South as he. Not only along the line of road improvement, but along every other line that made for the betterment of the people living along the great railroad system that he headed, he was active and zealous. In farm demonstration work, in bringing the farmers in closer touch with their markets, in teaching them new things along the line of cattle-breeding, fruit-growing, dairying and other lines of agricultural work, the hand of W. W. Finley was felt.

W. W. Finley was a great man. The South has not yet realized his real worth but the realization will come in the fullness of time. In his passing the good roads movement has suffered a loss that is almost irreparable and the South has lost one of her mightiest sons.

GOOD ROADS DAYS IN NORTH CAROLINA.

Governor Locke Craig's good roads days were very successful. Many hundreds of thousands of dollars worth of work was done on the roads of the state on November 5 and 6 and an interest was aroused whose value cannot be estimated in dollars and cents. The work was called to the attention of every citizen, high and low, in a very forcible way.

In Lexington, the home of this magazine, and in Davidson county, a great deal of very fine work was done. Ministers of the gospel, lawyers, physicians and business men, worked faithfully on the roads and while the work done did not amount to a great deal, their example was inspiring.

In this issue appear several fine photographs of squads of good citizens working the roads of the state. In Buncombe county Governor Craig put in two days of hard work. Several fine pictures of the governor in action are shown.

Moving picture men, always on the look-out for something new for the patrons of the "movies," were on hand in Buncombe and several hundred feet of fine film was the result, showing Governor Craig working the roads around Asheville. These films have been completed and are now going the rounds of the big vaudeville and moving picture circuits and North Carolina is getting much valuable advertising out of it.

Good roads days next year will be much more effective than this year. The results this year have opened the eyes of the indifferent and the skeptical and everybody will help when good roads days come again.

ZEPHYRHILLS.

A news dispatch from a little town named Zephyrhills, somewhere down in Florida, carried the story that on "Good Roads Day" the people of that town gathered at the beating of a drum early in the morning for work on the roads. At 7:00 o'clock 120 men, properly equipped, filed out of town and went to work on a sec-

tion of road that had been staked off previously for grading and surfacing.

There were plenty of wagons and teams and the amount of good accomplished was really astonishing. When they had finished for the day, the good folks were surprised. They had not thought it possible to accomplish so much with so little effort and as the shades of night were falling they came together for a few minutes rest before breaking up and going to their homes. Some patriotic citizen proposed that Zephyrhills keep the good work up for a period of one year and his proposition met with the hearty approval of every man present. They voted to meet on the third Friday in every month of 1914 and spend the entire day in road-working.

That is the right spirit and other communities ought to catch it. It is related that on "Good Roads Day" every business house in the town shut down for the day and that every citizen who was able to work was right on the job. Those who were not able to work put up \$1.50 to hire some one to fill their places, and not being able to hire anybody on Good Roads Day, it was arranged that the work should be done later.

We would like to know something more about Zephyrhills. Evidently, it is a community worth while.

"Mobile county does not have to go to other counties to study the method of working the convicts on the public roads, and, in the future, outsiders who are using, and intend using, this system of road making, must come to us," said Commissioner S. P. Gaillard, at a recent meeting of the Board of Revenue and Road Commissioners of Mobile county, Alabama, after the report of an investigation made by Road Superintendent J. H. Jackson as to the cost and methods of Dallas county was read.

The report of Superintendent Jackson shows that Mobile is operating its convict camp at a cost of 42 2-3 cents per day on an average, while the cost in Dallas county amounts to nearly \$1.00 a day.

As a result of the recent elections, Roy D. Chapin, of Detroit, president of the Hudson Motor Car Company; Austin B. Fletcher, engineer of the State Highway Commission of California, understood to be one of the most prominent highway engineers in this country, and Charles Whiting Baker, editor of Engineering News, are now members of the Board of Directors of the American Highway Association.

In connection with the election of Mr. Fletcher, comment has been caused by the fact that he was one of the first three students to take the course in highway engineering established at Harvard twenty years ago. The other two students were Logan Waller Page, who is president of the association and Director of the Office of Public Roads and A. N. Johnson, State Highway Engineer of Illinois, and a member of the American Highway Association. Thus all three of the first class of highway engineering at Harvard are now associated with the road movement as members of the association.

Walnut Cove, Sauratown and Danbury townships, Stokes county, North Carolina, have sold their bonds amounting to \$105,000 at a premium of \$1,600 and road work is already under way.

Delegates to the Southern Appalachian Good Roads Convention at Asheville, N. C., October 21-22



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Virginia Road Builders' Association

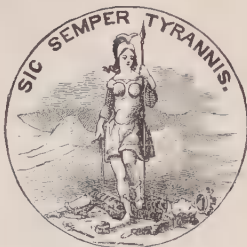
Organized Nov. 23, 1911

THE OBJECT OF THIS ASSOCIATION IS TO DEVISE
THE MOST EFFICIENT METHODS AND APPLIANCES
FOR ROAD BUILDING AND MAINTENANCE.

Through the courtesy of the publishers of SOUTHERN GOOD ROADS this page each month will be devoted to the interests of the Virginia Road Builders' Association. It is hoped that the members of the Association will feel free to make use of it. All communications should be forwarded to the Secretary.

By order of the Executive Committee.

C. L. SCOTT, JR., Secretary



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Richmond, Va.

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Culpepper, Va.

B. W. Hubbard
Forest Depot, Va.

D. Tucker Brown
Evington, Va.

C. B. Scott
Lynchburg, Va.

ARTICLE III. CONSTITUTION

MEMBERSHIP

Section 1. The membership of the Association shall be composed of all persons interested in road building in the State of Virginia who shall make application to the Secretary and pay the annual dues for one calendar year in advance.

ARTICLE I. BY-LAWS

Section 1. The annual dues shall be one dollar and shall be payable in advance.

The Richmond-Washington Highway.

The supervisors of Hanover county, Virginia, have done themselves and their county great honor in securing over \$22,000 to expend around Ashland on the Richmond-Washington Highway. These names are worthy of permanent record in the columns of Southern Good Roads: J. Z. Johnson, supervisor Beaver Dam district, C. S. Luck, Ashland district, and W. R. Shelton, Henry district.

Twenty-two thousand five hundred dollars is in hand for the improvement of roads in Ashland and Beaver Dam districts. This amount comes to the supervisors in this way: \$9,000 from the United States government, \$6,750 from the automobile association; \$3,250 from the Richmond, Fredericksburg and Potomac Railroad; subscriptions collected by Fenton Noland, \$1,500, and donations made by citizens of Beaver Dam and Ashland districts, \$2,000. This money will be used to better the roads between Ashland and Pinhook via El-

unting efforts in securing for them these magnificent highways. While the citizens of the upper end of the county are receiving these benefits, it is hoped that the time is not far off when the Henry district will be likewise benefitted.

* * *

Captain* P. St. J. Wilson, Virginia's state highway commissioner, says that the supervisors of Hanover county have agreed to the terms of the federal highway commission and the federal agricultural department and have signed the contract for building the



The Yanceyville Road in Pittsylvania County, Virginia



Difficult Section of the Cleveland-Lebanon Road, Russell County, Virginia

lett's Mill and Anderson's Bridge; also the road via Ground Squirrel Bridge to Pinhook.

The board held five meetings in Richmond, at which were present—John H. Wickham, superintendent of schools of Hanover county; William T. White, president of the Richmond, Fredericksburg and Potomac Railroad; W. D. Duke, assistant to President White; P. St. J. Wilson, State highway commissioner and Henry W. Anderson, president of the Good Roads Association of Virginia. To these men the citizens of Hanover county owe a debt of lasting gratitude for their

The Editor is indebted to Mr. Geo. E. Wray, of Pilkinton, Va., for much of the matter appearing on this page. EDITOR.

link of the Richmond-Washington highway through that county. By this the county will receive \$9,000 from the federal government.

The counties of Caroline and Spottsylvania have already signed the contracts and the same course will be taken in Fairfax county. Work has already begun in Hanover county.

* * *

Richmond Gets Into Line.

Colonel Dell W. Potter, president of the Southern National Highway Association has connected Richmond with the line of cities through which the Coast-to-Coast highway is to run. He wired Preston Belvin to call together the local bodies, comprising the following organizing or their representatives, and citizens generally: The Chamber of Commerce, Business Men's Club, Travelers' Protective Association, the Richmond Automobile Club, the United Commercial Travelers, the Retail Merchants Association, and the Richmond-Washington Highway Association.

These bodies all took hold in good earnest, realizing

that this highway is of vital importance to Richmond and the state of Virginia. Colonel Potter is one of the most prominent citizens of Arizona, and is known as the best speaker in that state.

The meeting at the Jefferson Hotel, Richmond, was very enthusiastic. According to Colonel Potter, the sum of \$8,750,000 has already been raised for the construction of this transcontinental highway. Richmond is the last city on the route to be reached by the organizers, and in the states to the south and west active construction is under way. The section from San Diego, Cal., to Yuma, Ariz., costing \$1,170,000, has already been built.

Arizona is preparing to issue \$2,000,000 in bonds to construct her share in the road; New Mexico has recently voted a \$500,000 appropriation; Texas has \$1,700,000 now available for this road; Arkansas has subscribed \$350,000; Tennessee has built the link from



Bituminous macadam road between North Tazewell depot and Tazewell, Va.

Memphis to Bristol, is about to vote \$1,500,000, and is building a \$3,000,000 railway and automobile bridge across the Mississippi River at Memphis.

The money paid by Richmond will buy 35,000 copies of a prospectus of the road to be issued soon, giving scenery, climate, products and other attractions of this section of the United States, which are to be used in advertising the project.

Oliver J. Sands' motion for a called meeting of the roads and legislative committees of the Business Men's Club and the Chamber of Commerce to consider means for securing the money for Richmond's share was unanimously carried. The names of Senators Swanson and Martin and Congressman Montague were mentioned in connection with talk of a legislative committee to secure federal aid for the project.

* * *

Two roads, both of which lead to Ashland, are to be macadamized. One is the route of the Richmond-Washington highway, adopted at a recent meeting of the Automobile Association, through Beaver Dam district from Newman's Mill on the South Anna, via Fork church and Pinhook to Anderson's bridge over the North Anna in the upper end of the district; the other is the Negrofoot road from Horseshoe Bridge over the South Anna to Pinhook, where that road connects with the Richmond-Washington highway.

The building of these two roads is a happy solution of a bitter fight occasioned in selecting the route of the highway.

Both roads will be built simultaneously. It would

take five or six years road taxes to build these roads in the regular way, but now their construction will be accomplished without an additional cent of taxation on the farmers of the district.

The non-resident lecturers in the graduate course in Highway Engineering at Columbia University appointed for the 1913-1914 session are as follows: John A. Benschel, New York state engineer; William H. Connell, Chief, Bureau of Highways and Street Cleaning, Philadelphia; C. A. Crane, Secretary, the General Contractors Association; W. W. Crosby, Chief Engineer, Maryland Geological and Economic Survey, and Consulting Engineer; Charles Henry Davis, President, National Highways Association; John H. Delaney, Commissioner, New York State Department of Efficiency and Economy; A. W. Dow, Chemical and Consulting Paving Engineer; H. W. Durham, Chief Engineer of Highways, Borough of Manhattan, New York City; C. N. Forrest, Chief Chemist, New York Testing Laboratory; Walter H. Fulweiler, Chief Chemist, United Gas Improvement Company; Frank B. Gilbreth, Consulting Engineer; George P. Hemstreet, Superintendent, The Hastings Pavement Company; Samuel Hill, President, American Road Builders' Association; D. L. Hough, President, The United Engineering and Contracting Company; J. W. Howard, Consulting Engineer; Arthur N. Johnson, State Highway Engineer of Illinois; William H. Kershaw, Manager, Paving and Roads Division, the Texas Company; Nelson P. Lewis, Chief Engineer, Board of Estimate and Apportionment, New York City; Harold Parker, First Vice President, Haslam Paving Company; Paul D. Sargent, Chief Engineer, Maine State Highway Commission; Philip P. Sharples, Chief Chemist, Barrett Manufacturing Company; Francis P. Smith, Chemical and Consulting Paving Engineer; Albert Sommer, Consulting Chemist; George W. Tillson, Consulting Engineer to the President of the Borough of Brooklyn, New York City.

A mass meeting was held in the opera house at Temple, Texas, last month for the purpose of organizing a good roads association. The following officers were elected:

John G. McKay, chairman; Roy R. Campbell, vice chairman; B. B. Buckridge, secretary; Chas. M. Campbell, treasurer. A large executive committee was also named, comprising one member from each voting box in Justice Precinct No. 5 of Bell county. A good roads district will be surveyed and laid out composed of such districts as exhibit a disposition to support the movement and a petition will then be presented the commissioners court asking for the creation of such district, which when granted will be the signal for launching a campaign for a bond issue of \$500,000 with which to build the roads.

Extensive preparations are being made at Hopkinsville, Kentucky, for good roads week, which will be observed there the first week in December. D. Ward King, the inventor of the homely split log drag, is to be the center of attraction for five days. On these days he will visit four sections of the county and show the people how to build the drag and to operate it best.

He will also endeavor to arouse enthusiasm in good roads among the people and to organize them in a movement to keep the roads in good order instead of letting them become impassable before attempting repairs.

Attala county, Mississippi, is asking for bids on 17 miles of high class roads.

North Carolina Good Roads Association

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Chapel Hill, N. C.
Miss H. M. Berry, Asst. Secretary
Chapel Hill, N. C.
Joseph G. Brown, Treasurer
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H. E. Stacy, Rowland



OBJECT: To promote the proper location, construction and maintenance of roads so that every road in North Carolina will be a GOOD ROAD 365 days in the year

This page will be devoted each month to the interests of the North Carolina Good Roads Association. Contributions solicited. Copy for this page should be sent to MISS H. M. BERRY, Editor, CHAPEL HILL, N. C.

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OBJECT.

In undertaking this page for Southern Good Roads we will try to give first such news items with regard to road work going on in the state as will be of interest; second, such information with regard to new methods of road building and maintenance as is thought will be of service to the North Carolina road builders; and third, statistical data collected for the purpose of showing in detail and collected figures the inadequacy of present methods of road administration and road building, and the advisability of certain other methods which have worked out to advantage in other states.

From this data it will be possible for those interested in the inauguration of better methods of road administration, construction, and maintenance, to work out such laws as will give them the greatest benefit possible from their road funds.

That there is a powerful individual interest aroused in the building of a system of good roads for each county in the state and for the state at large as well as for townships and neighborhoods, cannot be gainsaid; but that this has crystalized so as to form a sentiment by which the best possible state laws and most systematic county laws shall be given to the state generally, has not yet come about. It is hoped that the effort given to this North Carolina Department will bring about such reaction from the intense individualism and conservatism of our state as will result in the adoption of a wise, systematic, and business like method of building a system of roads which will give outlet not only to the people of each township toward its trade center, but will end in a county system, a state system, and a national system of good roads.

* * *

Private Subscriptions For Roads.

One of the most striking features of road work in North Carolina today is the interest manifested by individuals in building good roads, as shown by the numerous sums subscribed by private individual for building links of road in various sections of the state. Thus we hear of subscriptions for the Davidson-Randolph Highway; of private subscriptions for the Hickory Nut Gap Road; of private subscriptions for building certain links of road in Harnett county; and a purse of \$4,000 made up by private subscription for building a sample of sand-clay road in Bladen county; and various contributions of labor and teams for building and improving bad stretches of road. We hear of a bunch of forty men of Brushy Mountain township,

Wilkes county, getting together and building about 350 feet of good road over the worst piece of road in the township. They organized the Brushy Mountain Betterment Association and elected R. S. Griswold President. We hear from the Rowland Sun that in Robeson county on October 7th the people of the neighborhood brought twenty-two wagons with other labor for hauling dirt on a certain stretch of road.

In other words, there is a great individual awakening in our state to the necessity for good roads and these individuals are doing everything possible toward educating the people generally in better methods of road building and to the value of good roads. The value of this individual effort, however, could be greatly enhanced if we had a state department which could furnish trained engineers to assist in the expenditure, not only of these individual subscriptions but of county and township bond issues, and help to make every dollar count instead of spending what money we have in a more or less haphazard way.

* * *

Good Roads Days.

The governor's proclamation, setting aside November 5th and 6th as Good Roads Days has been very generally approved and supported by the citizens and press of the state. An effort was made to thoroughly



Governor Craig delivering a good roads speech in Buncombe county.

organize the various counties of the state for the work on these two days, and the State Geological Survey distributed as widely as possible printed slips giving

suggestions as to organization and the kind of work which could best be accomplished at this time.

A pamphlet was also prepared by the North Carolina Geological and Economic Survey, which was printed and distributed by the State Board of Education for use in the public schools of the state. This pamphlet gave detailed information which could be used by the teachers for a Good Roads-Arbor Day program. In his letter to the county superintendents, Board of Education, and teachers, Mr. Joyner says:

"To become permanent, all great movements for civic and industrial improvement must begin with the teaching of the children in the schools. The rising generation should be taught the necessity and importance of good roads in North Carolina; should be brought to see the relation of these to the future comfort, progress and prosperity of the state along all lines. Nothing is more essential than good roads for increasing the efficiency of our country schools."

The net result of the work done and interest created among all classes of our citizens on these two Good Roads Days will bear a fuller fruition than we yet realize, and has been undoubtedly the means of bringing to the attention of our people the value of co-operative effort along all lines pertaining to the common welfare. The suggestion of a civic week, made by the acting-president of our state university in his speech in Charlotte recently, is an excellent one and, if adopted, will be the means of bringing the attention of our best citizens to the real problems affecting our towns, our counties, and our state, and doing away with the more or less fictitious problems with which politicians are

accustomed to obscure the real issues of our common life.

* * *

County and Township Bond Issues.

It has been iterated and reiterated by the various good roads conventions held in this state, through road literature of the North Carolina Good Roads Association and of the North Carolina Geological and Economic Survey, through National Road organizations, through Southern Good Roads and the press generally the desirability of the county bond issue over the township bond issue and of a system of county road rather than township roads. In order for the farmer to benefit by a good road it must be good throughout its entire length, and not have sections of good and bad road because his load will be limited by the poorest stretch in the road over which he has to haul; so that if one or two townships in a county have good roads and the other townships have poor roads, the townships having the good roads will not reap the full benefit which they otherwise would if their good roads connected with good roads in other townships, and these in turn were connected with good roads of another county, etc. In other words, we want good roads "beginning somewhere and ending somewhere" rather than disconnected links of good and bad road.

When a county turns down a bond issue the usual result is for the wealthier and more progressive townships to issue bonds for their township roads. The final outcome of this policy is that when the poorer townships realize the necessity for good roads they will find that these richer townships, having already



EVERYBODY HELPED.

This photograph shows how the boys in the Masonic Orphans' Home at Oxford, North Carolina, responded to the call of Governor Craig on Good Roads Day. Every boy big enough to wield a pick, or shovel, was on the job.

paid for their roads, do not care to burden themselves with an additional tax to build the roads in those counties which helped to vote down a county issue in the beginning, and thus the difficulties of securing a county system of good roads are greatly increased.

The point to the above is that Halifax county has not taken advantage of an act of the legislature by which

have the advantage of more than a local system of roads.

Warren county has tried for a bond issue, but it failed by a majority of 200. The inevitable township bond issue will most likely be the result.

More Important Than Tariff or Currency Legislation

At the good roads meeting in St. Louis, Mo., last month, Governor Elliott W. Major, of Missouri, was the principal speaker. He made a fine speech. He declared to the assembled delegates and visitors that more important than tariff and currency legislation, was the road question. He showed how bad roads are keeping the farming industry on a low plane and followed that by describing eloquently the relation between the farmer and the general prosperity of the nation. Among other things Governor Major said:

"The farmer is the man who is making history and is the primary developer of natural resources. Good roads are particularly beneficial to him, affording cheaper haulage to markets and eliminating waste of time.

"Despite the fact that agriculture is the basis of all wealth, the government has never aided in making roads for the farmer. It has helped the railroads, the telegraph lines and other great ventures, but the mainstay of the nation has been forgotten. The government spends a thousand million annually for education, for the army and navy, for the upkeep of departmental buildings at Washington and for the postal service, but not a penny for good roads in the United States. And this despite the fact that the government has spent enormous sums for good roads in the Philippines, Alaska and Panama. It is high time the government began building roads at home.

"I am willing to join the other delegates present and go to Washington and bring every bit of pressure possible to secure federal aid for good roads in America."



Another picture of Governor Craig on the roads of Buncombe.

the county could have voted a county bond issue. Not being able to secure a county issue, Halifax township has now voted \$60,000 and Enfield township \$40,000 for good roads. There are nine other townships in Halifax county which should have combined with these two townships in getting a county system of good roads. This would have resulted not only to their own great benefit, but would have enabled the two progressive townships which have voted bonds for good roads, to



ON WILD CAT RIDGE.

This photograph shows the members of the Brushy Mountain Township Improvement Association working the Wild Cat Rock Road in Wilkes county, North Carolina. This association is a live one and does not wait for a governor's proclamation to get busy.

South Carolina Good Roads Association

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Edited by PROF. F. HORTON COLCOCK
University of South Carolina, Columbia, S. C.

SOUTHERN GOOD ROADS will devote this page exclusively to the interests of the South Carolina Good Roads Association. It will be open at all times to contributions from members of the Association in regard to Association affairs and road problems in the State. Send all contributions for this page to F. HORTON COLCOCK, University of South Carolina, Columbia, S. C.

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A meeting of the United States Good Roads Association held at St. Louis, Mo., from the Tenth to the Fifteenth of November indicated a step far forward in the interest of the people of the United States in this wonderful movement which ought to be a pioneer movement rather than a post-civilization movement. When representatives from more than 32 states of this great Union travel to St. Louis from as many as fifteen hundred miles away, to push forward an object, it shows the intense arousing of this vast population to the purpose for which this meeting was held. The immediate object of this meeting was to impress upon the nation the importance of this matter being taken up as a national measure. A good many secondary matters arose, all of which were pulling towards the same end. They certainly accomplished a great deal in one respect alone when a committee was appointed with power and for the purpose of conferring with similar committees looking towards bringing together the various national organizations that are now working for the same purpose. I am convinced that when these committees get together and all of these organizations unite in bringing their influence to bear upon the national congress that the voice will be so loud and the arguments so earnest that the subject of good roads will be recognized to have become one of the most vital economic issues in the public policy of our nation.

It will be impossible in a limited article for me to put forward the forcible and earnest and true arguments that were made at this congress. They all tended to show that the day for the recognition of the importance of good roads is past and the only question that now faces the people is the question as to the method and means. It was surprising to find, however, how wide was the diversion of opinion as to what part the national government should take in this question. All agreed that it was a matter for national consideration but just as to how that national aid and consideration should immediately be put into effect produced divergence of opinion. In a general way the opinions diverged along the old line of nationalism and state's rights. But it was prepondering voice of the convention that the late war between the states had wiped out the idea of the individual sovereignty of the states to that extent which would prohibit the United States as a sovereign power exercising its right to advance the interests of the nation as a whole in any of its economic designs. This is right and proper. I say it as one who has always held to the states rights prin-

ciples but surrender for the benefit of posterity to the status quo.

There is no question of the fact that wherever the United States government undertakes to do some great public work for the public good it has the power and the means to carry it forward with the dignity and



Mr. J. Roy Pennal, Highway Engineer of Marion County, South Carolina, inspecting One of His Fine Sand-Clay Roads One Week Old

support that nothing else can afford. This being acknowledged the further question arises as to how it will impress the people. Now nothing so impresses a people as to see their contributions to any government being expended immediately in their vicinity for their individual advantage. And hence the

masses of the people throughout the United States for the first time would feel less burdensome the tax which falls upon them.

Now, how shall the aid of the United States be brought directly to the homes of the citizens? This question was divided into three distinct and separate plans. Each of these had its most earnest advocates namely: National Highways, that might be called national in the sense that they were transcontinental, national highways confined to individual states following the meridians of latitude and the meridians of longitude or in other words, setting examples of great roads like the Appian Way built as types for the people to follow, and third and last, appropriations to be supplemented by states and minor units building from the home outward. In other words I may separate the ideas into two rather than three, shall we build from without inward, or from within outward? These are questions to be decided after the people have impressed upon congress the necessity of making the establishment of good roads a vital national question.

Now with regard to these various ideas it will be impossible for me in this article to bring out the arguments of their respective merits and I propose therefore to discuss them separately in further issues of this magazine. Let us all then pull together to make the representatives of this great nation recognize the fact that inter-communication and facilities for exchange of commodities even in the short stretches of the ordinary road is as much a part of the development of this nation as the shortening of the route from New York to San Francisco by the Panama Canal.

GOOD ROADS NOTES IN BRIEF

Kinney county, Texas, has voted bonds for \$100,000 to build roads.

Warrenton township, Warren county, North Carolina, has issued bonds for \$50,000 for road construction.

Midlothian district of Ellis county, Texas, voted a bond issue for roads of \$35,000 on November 20th.

Road precinct No. 3, of Bell county, Texas, will vote December 20 on a bond issue of \$30,000 for roads.

The town of Clarksville, Texas, votes on the 16th of this month on a bond issue of \$20,000 for street improvement.

Rappanhannock district of King George County, Virginia, votes this month on a bond issue of \$10,000 to start road improvement.

Mercer county, West Virginia, will have an election soon on a proposition to issue bonds for \$500,000 for road work.

The First Road District of Ascension parish, Louisiana, has contracted for the construction of 23 miles of gravel roads.

In Robertson county, Texas, precinct No. 2 has contracted for the construction of 40 miles of roads at a cost of \$150,000.

Jackson county, Missouri, has contracted for the construction of about 5 miles of macadam road at an outlay of \$30,000.

The city of Columbus, Mississippi, will pave five blocks with asphalt. The contract for this work has not yet been awarded.

Fort Myers, Florida, is asking for bids on the construction of nine miles of shell streets.

Caleasieu parish, Louisiana, has voted bonds for \$900,000 to build good roads. An engineer from the U. S. Office of Public Roads is now in the parish map-

ping out a system of roads and making estimates. Work will begin in the spring.

Jacksonville, Florida, is asking for bids on 65,680 square yards of pavement.

Little Rock, Arkansas, is preparing to spend \$14,000 in paving certain streets with creosoted wood blocks.

Morgan county, Missouri, is asking for bids on the construction of 20 miles of roads.

Lake county, Florida, has voted an issue of bonds for half a million dollars for the construction of roads.

Contracts have been let for the construction of 60 miles of good roads in Pike county, Mississippi.

Montgomery county, Texas, has voted \$150,000 of bonds for road-building.

Beat No. 5, Hickory county, Texas, has voted \$100,000 of bonds for good roads.

The town of McKinney, Texas, has voted \$75,000 of bonds for street improvement.

Eagle Pass, Texas, votes on the 20th of this month on a bond issue of \$60,000 for streets.

Freestone county, Texas, has called an election for December 16 to vote on a \$50,000 road bond issue.

Hunt county, Texas, votes December 27 on a road bond issue of \$400,000.

Medina county, Texas, will vote Jan. 6, 1914, on a road bond issue of \$40,000.

On December 16, the town of Palmetto, Florida, will vote on a bond issue of \$50,000 for street improvement.

Calhoun county, Alabama, has contracted for two miles of state aid road.

Marshall county, Alabama, has contracted for the construction of one road at a cost of about \$40,000.

Orange county, North Carolina, has let contracts for 13 miles of sand clay roads.

Jackson county, Kansas, has contracted for road work amounting to \$32,577.

Americus, Georgia, catching the good roads inspiration from the progressive county in which it is situated, has contracted for 1¼ mile asphalt, bitulithic and wood-block pavement.

Medina county, Texas, has \$40,000 available for road work.

Lake Charles, Louisiana, will lay 38,000 square yards of brick paving.

Pine Bluff, Arkansas, will pave Pine street with asphaltic concrete at an estimated cost of \$12,000.

Grayson county, Texas, will spend \$4500 on one mile of road.

St. Petersburg, Florida, will construct a six mile boulevard of brick or concrete.

Tarpon Springs, Florida, will construct seven miles of concrete walks at an estimated cost of \$20,000.

The city of Raleigh, N. C., awarded 40,000 square yards of asphaltic concrete paving to R. G. Lassiter, using Aztec asphalt of the United States Asphalt Refining Company.

Henderson, N. C., has awarded contract for the completion of its present paving program, amounting to 60,000 square yards of asphaltic concrete. The council adopted Aztec Asphalt for use in the work.

The city council of St. Louis, Missouri has ordered an election on March 10, 1914, to vote bonds for \$2,750,000 to finish bridge across the Mississippi.

Gillespie county, Texas, has contracted for a bridge 300 feet along across Barrons creek at a cost of \$8,000.

The administrative board of Richmond, Virginia, has accepted plans for the great reinforced concrete bridge, 3480 feet long, to be built across James river at Ninth avenue at a cost of \$600,000.

The city of Meridian, Mississippi, has let contracts for the building of a dozen bridges at a cost of about \$15,000.

GOOD ROADS NOTES

GATHERED HERE *and* THERE

Alabama.

With a representative and enthusiastic delegation present, the second meeting of the Birmingham-Montgomery Highway association was held at Clanton, Alabama, on November 10, with the president of the association, W. S. Keller, and the secretary, B. M. Roberts, both in their places.

R. E. Bowden, of Calera, the committeeman from Shelby, reported that since the last meeting his county board of revenue had let a contract for the completion of that portion of the highway which reaches from Calera to the Jefferson county line, and assured the association that the other portion will be built connecting with the lower section of the highway at the line of Chilton county.

Committeeman Dan Greene, of Birmingham, made a stirring and enthusiastic speech. He said that under the law Jefferson could not build roads outside her own territory, but she would put that part of the highway within her own precincts in fine order, and would not be a claimant upon the funds of the association itself, which were thus let loose to go elsewhere.

One speaker representing a good roads movement which is tributary to the highway, said that his road had advanced the price of real estate on both sides for 10 miles around from \$10 an acre to \$100. Affiliated road movements are springing up in different quarters in response to the general interest in the subject aroused by agitation.

The executive committee reported as a result of recent meeting in Montgomery a constitution and by-laws through F. W. Lull, of Wetumpka. The constitution was unanimously adopted after slight amendment which was agreed to.

Judge E. B. Deason, of Chilton, proposed a committee to decide upon the most feasible route through Chilton county and to solicit subscriptions. After some discussion a motion prevailed authorizing W. W. Fox, the Chilton county committeeman, to appoint eight citizens as a committee on right of way and subscriptions. State Senator T. A. Curry, of Clinton, delivered an address which was well received, and was especially inspiring. Mr. Fox reported that the Chilton board of revenue had just voted \$800 for the present demands of the highway, and that they would do more in due time. This amount will be supplemented by the state aid.

Judge Deason reported seven miles of graded road belonging to the Louisville and Nashville, from which rails have recently been removed and which could be utilized. It reaches from Jemison to Ocampo.

Judge Dan Greene, of Birmingham, was elected vice president of the association.

* * *

Arkansas.

The great state of Arkansas is waking up on the road question, though it still has but little to boast of in the way of good roads. It is said that there are not as many automobiles in the whole state of Arkansas as can be found in the city of Dallas and Dallas county, Texas. In some sections, however, there is great activity.

Pulaski county, of which Little Rock is the county seat, as well as the capital of the state, is converting all the established roads in its confines from Little Rock

to the county line into turnpikes. Some other counties are also doing likewise, utilizing convict labor. The different communities between Little Rock and Texarkana are co-operating in an effort to get the 148-mile pike finished that will connect these cities. About sixty miles have been completed.

With good roads into Texas, Little Rock would be on a highway to Washington. There is now an excellent road from that city to Memphis.

The state of Tennessee has practically completed from Memphis to Bristol a pike thirty feet wide with a sixty-foot right of way. From Bristol to Washington there is a fine road, and from the national capital in every direction first-class highways are much in evidence.

* * *

Florida.

Interest in good roads in Florida is growing rapidly, as the following items clipped from Florida exchanges in a single day, will show:

Work is progressing on the cement culverts and bridges between this place and Cocoa. When the hard surface is placed on the road one of the places where there was virtually no road at all, on the East Coast road, will be obliterated, and in its place will be found several miles of the very best roads.—Eau Gallie Record.

We want that road to Sebastian put in good condition so our friends can come over here and visit us. We can almost hear the honk of their horns as they motor by Sebastian. Broadway should be well lined with the vehicles of those who want to visit Fellsmere every day of the year, but lack of communication prevents. Our county commissioners are due in this vicinity right now, and they must not fail to connect.—Fellsmere Tribune.

The cause of good roads is doing well in Florida and the prospects for the near future in quite a number of the counties are really brilliant. What was accomplished during 1912 in that direction is shown by the fifth annual report of the state geologist, which puts the number of completed miles of good roads in the state at 2,848. Of this number 857.8 were surfaced with marl or crushed stone; 1,408.75 were surfaced with sand-clay; 218 miles were surfaced with shell; 5.2 miles with cement; 26.5 with gravel; 4 miles with asphalt and 8.5 miles with brick. The total expenditure during that period exceeds \$1,000,000.—Lakeland Telegram.

The sentiment in favor of good roads is growing fast in Levy, and many of those who have heretofore been either opposed to the movement or lukewarm in their support, fearing that it would be a bad move to put the county in debt in order that good roads might be built, are enthusiastic in their advocacy of hard roads. It is understood that there will be a petition presented to the county commissioners at their next meeting asking that an election be called to establish a special tax sub-road district at Bronson. The movement has the endorsement of the most progressive citizens here, and the road district will doubtless be created.—Bronson Times-Democrat.

* * *

Georgia.

The building of a highway from Columbus to Warm Springs, to be known as the "Magnolia Route," was

practically assured by the generous subscriptions made at a mass meeting of citizens at Waverly Hall, Harris county, last month. This will be practically the last link in a modern highway connecting the capital of Georgia and the capital of Florida.

The meeting at Waverly Hall was presided over by Frank G. Lumpkin, of Columbus, and Willie B. Powell, secretary of the Columbus board of trade, was secretary. The Columbus-Harris county Pine Mountain Road association was formed. The money required for building the road through Harris county, \$8,000, has been subscribed.

Muscogee, Talbot and Meriwether counties will also do their part.

* * *

Missouri.

The Western Missouri Good Roads Association, of which Mr. Howard C. Murphy, of Joplin, is president, is assisting in constructing a road which eventually will extend from north Arkansas to Kansas City by way of Joplin. The highway is practically completed from Joplin to Neosho and a great deal of construction work has been done between Neosho and Anderson. This entire stretch of road will be completed within a short time. From Anderson the rock road will be completed to Noel, thence to Sulphur Springs, Ark., and from there to Rogers, Ark.

This thoroughfare will pass through one of the most picturesque regions in southern Missouri. The association also is making active preparations for the construction of the highway to the south Barton county line. Meetings have been held in Barton county and the citizens are enthusiastic for the road and will lend their assistance in building it through the county.

* * *

Oklahoma.

According to news reports sent out under date of November 25, several hundred of the progressive citizens of Durant, Oklahoma, gathered on that day and organized the Bryan County Good Roads Association. The main object of the meeting was to secure a place for Durant and Bryan county in the plans for the Oklahoma, Texas and Gulf Highway Association which was organized at Dennison, Texas, one week before.

The meeting was attended by progressive business men of Durant and other parts of Bryan county. During the meeting representatives from Colbert and Callera handed in checks for \$50, the amount pledged by their little cities to assist in the present campaign from Denison to Oklahoma City.

Denison sent a check for \$190 to assist in the Oklahoma work. Citizens of Durant donated the balance of \$250 needed to carry on the work in Bryan county.

Colonel Sidney Suggs, state highway commissioner of Oklahoma, spoke of the good roads work in Oklahoma, pledging his support and the work of state convicts for good roads work. Other speakers were: W. A. Durant, W. J. Milburn, president of the Oklahoma, Texas and Gulf highway; Colonel Lyon, mayor of Sherman, and O. L. Williams, field secretary of the Colorado-to-the-Gulf Highway association.

President C. O. Johnson appointed the following committee to act with the president: A. N. Leecraft, E. C. Terrell, J. T. Foote, mayor of Durant; Walter Rambo and E. C. Terrell.

After the next meeting this organization will issue a call to the counties along the proposed route to Oklahoma City and they will have a general meeting at once. Subscriptions will be asked for and with the assistance which has been pledged by the county com-

missioners, work will begin by Jan. 1 on permanent roads.

State Highway Commissioner Sidney Suggs stated during the meeting that Oklahoma convicts could soon be obtained to work the roads and that he would pledge their work in the district now mapped out from Durant. It is proposed to have the roads fork at Durant, one line following the Missouri, Kansas & Texas railroad north through Caddo, McAlester and Muskogee, the other road to fork northwest through Milburn, Mill Creek to Oklahoma City.

* * *

Tennessee.

It is announced in the Nashville Banner that the University of Tennessee at Knoxville has arranged for a special short course in highway engineering to be given during the first eight weeks of the coming year.

The state is spending immense sums for building better roads and there is great demand for engineers better prepared to do the work.

The courses offered are planned to meet the needs of men who have been too busy at work to attend an engineering school, men who have learned from experience their need of additional training in mathematics, drawing, etc. No entrance examinations are required. There will be no fees to pay. There is no age limit except that no one will be admitted under the age of 16.

In mathematics the work will be given to meet the needs of the men who enter, with particular attention to the use of trigonometry in plane surveying. Practice will be given in the use of logarithms. Five recitations will be given each week. The course is in charge of Prof. Hamilton.

The student is advised to bring whatever text-books he may have.

The drawing course will be given to meet the needs of civil engineers and surveyors who are called on to make maps, profiles, simple bridge designs. Particular attention will be given to lettering and finishing drawings in neat manner. Students should bring the best drawing instruments available, including triangles, T. squares, scales. No text book required. The course will be given three times each week in three hour periods by Prof. Matthews or Prof. Ferris.

Lectures will be given on use and care of surveying instruments, manner of checking errors and correcting them, keeping notes, etc. Field exercises will be given as needed to train in careful execution. The course will be given three times each week in three hour periods, conducted by Mr. Fergus.

Lectures will be given on road building, selection of route, establishing grades, ditching, culverts, selection of road covering, etc. A careful study will be given the various materials available, including use of bituminous binders and road oils. It is the purpose of this course to make the student familiar with the work now being done by the United States Office of Public Roads, and by road departments of various states. This course will be given by Prof. Carson, Prof. Ferris, Mr. Fergus, of the University faculty, and with the assistance of experts of the United States office of Public Roads, who will give illustrated lectures of great interest and value.

The university is equipping a laboratory for testing road materials, and so far as time will allow and the ability and needs of the students will admit, they will have opportunity to compare by actual test the various rocks available as road covering. Pupils are requested to bring a sample of the rock available for road building. This sample should not weigh less than 25 pounds. Each piece of sample should be not more than three

inches nor less than 1½ inches in largest dimension. If gravel is available, a 25-pound sample should be brought. The sample should not contain stones greater than one inch in largest dimension. Opportunity will also be given for making laboratory tests of cement and concrete. The course will be given three times each week in three hour periods. No text book is required.

Engineers will be taught methods of steam measurement, calculation of power available, design of simple dams. The course will include study of selection of machinery, etc., given twice each week in three-hour periods. No text books required. Prof. Switzer and Dr. Perkins will be in charge.

At least once each week will be held a conference of engineers, when subjects of interest will be discussed. The engineers attending will be expected to take part in these discussions.

No fees or tuition are charged for these courses. Text books and supplies will cost not to exceed \$5.

The executive committee of the Jackson-to-Corinth Highway Association, organized at Jackson, Tennessee, several weeks ago, will call a meeting of the association at Selmer, Tenn., early in this month for the purpose of getting down to business.

It is expected that there will be at least 30 delegates present at this meeting from the counties of Alcorn, Mississippi, Madison and Chester, Tennessee, and a very large attendance from McNairy county, of which Selmer is the county-seat, is expected.

McNairy county has not been taking the interest in the road that could be desired and it is hoped that this meeting will serve to stir up the McNairy commissioners to the necessity of building the road through their county.

* * *

Mississippi.

The Lauderdale County Board of Trade, in session at Meridian, Mississippi, last month, on the recommendation of its good roads committee, composed of Messrs H. F. Broach, Chairman, Walter C. Hodges, Sam Meyer and W. P. Moore, appointed a committee to draft a bill for the establishment of a state highway commission for Mississippi. This committee is composed of Messrs C. C. Dunn, J. M. McBeath and H. R. Stone, and it will work in conjunction with the Mississippi Travellers' Association. This association, through its good roads department, is working hard to arouse the entire state to a need of competent state supervision of highway work and organized trade bodies throughout the state are being appealed to for aid.

It is expected that the next legislature of Mississippi

will pass a bill providing for a state highway commission.

The commissioners of Baltimore county, Maryland, are asking for bids on the construction of concrete culverts on the Painter's Mill Road.

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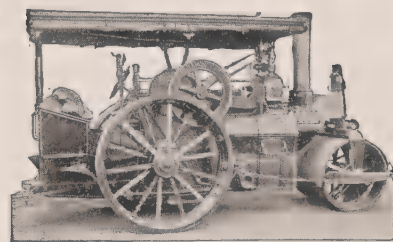
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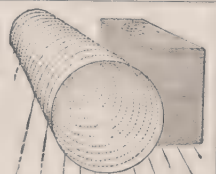


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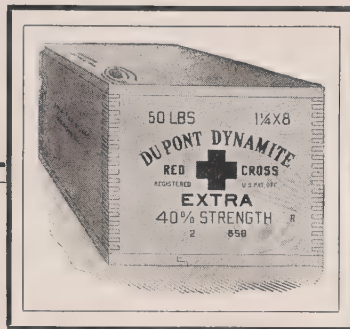


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WILMINGTON, DEL.

Established 1802

PIONEER POWDER MAKERS OF AMERICA



BIG FOURS ARE FAST ROAD - MAKERS

The Big Four "30" has three speeds forward and one reverse. High speed for surfacing and light hauling; intermediate speed for the heavy grading; a low gear for the hills and tough spots. Three tractors in one.

Big Fours are known the country over as good tractors. Write at once for our road-making catalog.

Emerson - Brantingham Imp. Co.

(Incorporated)

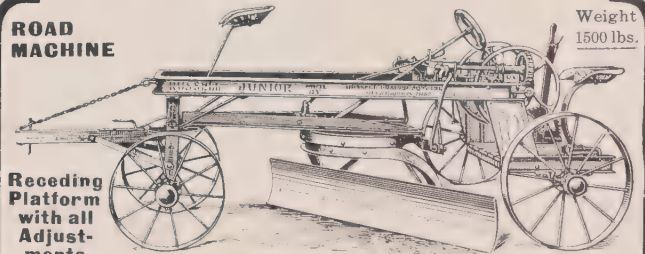
181 W. Iron St., Rockford, Ill.

RUSSELL JUNIOR

ROAD
MACHINE

Weight
1500 lbs.

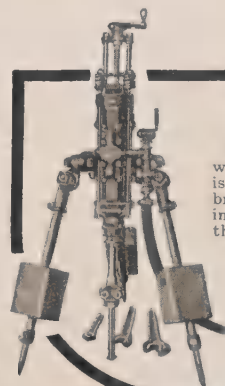
Receding
Platform
with all
Adjust-
ments



Complete in every detail and built on the lines of a larger machine. Ideal machine for light and ordinary road work for two or four horses. This type machine is also made in two larger sizes: "Standard" eight horse, 3000 lbs. and "Traction Special" for engine power, 3,500 lbs.

We make a complete line of earth handling machinery. Our 72 page catalog sent free.

RUSSELL GRADER MFG. CO.
2230 UNIVERSITY AVE., S. E. MINNEAPOLIS, MINN.



Improved Wood Rock Drills

The Front Head is made of malleable iron, hence will not crack or break under jarring strains, and is held in place by four bolts. The bushing is of bronze and in the event of wear, can be replaced in the field, at nominal expense. This is a feature that will be appreciated by practical men.

Wood Drill Works

30 Dale Ave., PATERSON, N. J.

Agents: Baskerville & Co., Title Guarantee Bldg., Birmingham, Ala.
E. F. Craven, Greensboro, N. C.

J. M. JOHNSON
CHAIRMAN

M. TAYLOR BAKER

F. A. SMITH

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W. F. STACKHOUSE

Marion County Road and Highway Commission

L. D. LIDE,
CLERK

Marion, S. C. Nov. 21, 1913.

Harry Bros. Co. Inc.,
Newport, Ky.,


Dear Sirs:

More than a year ago we began using your metal culverts and have been using them continuously ever since and so far they have never given us the least bit of trouble either in installation or in standing after they have been put in although of course the time has not been long enough for a "Time" test of any value. So far have seen no indications of corrosion on any of your pipe installed.

The workmanship on your pipe has been absolutely satisfactory and I think that your method of making the round riveted culvert gives the most substantial culvert on the market.

As long as we continue to buy metal culverts you will get our orders.

Very truly yours,


Resident Engineer,
MARION COUNTY ROAD & HIGHWAY COMMISSION.

Here's another letter from a prominent Highway Engineer, and this time it's from South Carolina. Mr. J. Roy Pennell, of Marion County, (S. C.) has certainly built some pretty roads for his county and in the next issue of this paper we expect to show a few photographs of these and other Carolina Good Roads.

"Lest we forget" OUR "GENUINE OPEN HEARTH IRON" CULVERTS are 99.875% Pure Iron.

HARRY BROS. COMPANY, Inc.

NEW ORLEANS, LA.

NEWPORT, KY.

STANDARD

Mexican Asphalt Macadam Binders and Asphalt Road Oils



Morehead Ave. and Duke Street, Durham, N. C. Treated With Standard Asphalt Macadam Binder

STANDARD ASPHALT BINDERS are made in three grades, "A," "B" and "C," for use under varying conditions of road maintenance and construction.

These products are absolutely pure, containing 99 per cent. bitumen, and can be manufactured to any consistency desired. The three grades "A," "B" and "C" will be found to solve all problems of road surfacing or road construction that are ordinarily met with.

BINDER "A." A semi-solid product to be applied hot over stone or gravel roads subjected to heavy automobile travel. A covering of sand or screenings is necessary after Binder "A" is applied.

BINDERS "B" AND "C." Solid products used for road construction under the penetration or mixing methods—many hundreds of miles of roads in all sections of the country speak for the uniform success of these products of producing **DUSTLESS, PERMANENT ROADS.** BINDER "C" is slightly harder than BINDER "B" and is used in sections subjected to long continued heat.

Standard Asphalt Road Oils

STANDARD ASPHALT ROAD OILS are made with varying percentages of asphalt, from the lightest, containing 30 per cent asphalt, to the heaviest, containing 60 per cent. asphalt. Used under all conditions necessitating freedom from dust and protection of surface.

A full description of our various products, with specifications for correct use, is given in our illustrated Booklet, sent free upon request.

Standard Oil Company

(Incorporated in New Jersey)
ROAD OIL DEPARTMENT

Baltimore, Md.

Richmond, Va.

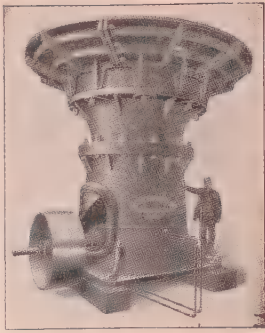
Charlotte, N. C.

Norfolk, Va.

Charleston, W. Va.

Newark, N. J.

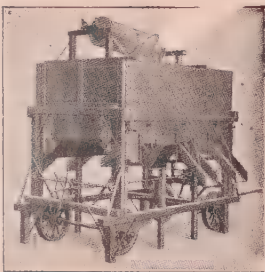
Washington, D. C.



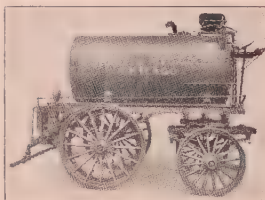
Austin Gyrotory Crusher



Aurora Rock Crusher



Aurora Bins and Screens



Austin Road Oiler



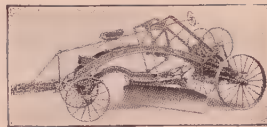
Austin Sprinkler



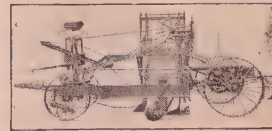
Austin Sweeper



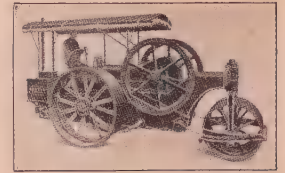
Austin Motor Mower



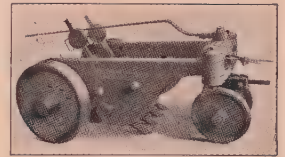
Giant Grader



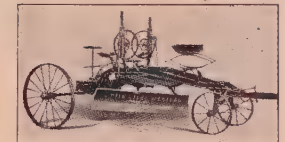
Elevating Grader



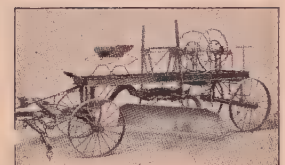
Austin Motor Roller



Austin Scarifier



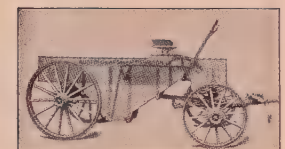
Little Western Grader



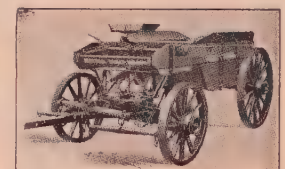
Western Grader



Austin Grader



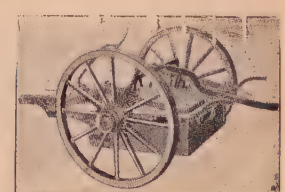
Austin Stone Spreader



Aurora Dump Wagon



Austin Dump Wagon



Western Wheeled Scraper

The Austin = Western

LINE OF

ROAD MACHINERY

is the largest, most complete and oldest established in the United States.

It is the only complete line manufactured entirely by one concern, sold and guaranteed direct from factory to user.

Numerous branch offices and warehouses established in every section of country, insure prompt and efficient service to our customers.

Direct representatives in every State

THE AUSTIN-WESTERN

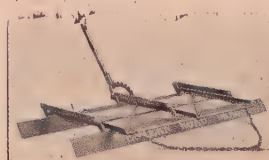
ROAD MACHINERY CO.

CHICAGO

New York City
Dallas, Texas
Durham, N. C.

Syracuse, N. Y.
Atlanta, Ga.
San Francisco and Los Angeles, Cal.

St. Paul, Minn.
Memphis, Tenn.



Road Drag



Drag Scraper





